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ERAWATCH Country Reports 2013: Bulgaria

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ERAWATCH Country Reports 2013: Bulgaria

Rossitsa Chobanova

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Abstract

The Analytical Country Reports analyse and assess in a structured manner the evolution of the national policy research and innovation in the perspective of the wider EU strategy and goals, with a particular focus on the performance of the national research and innovation (R&I) system, their broader policy mix and governance. The 2013 edition of the Country Reports highlight national policy and system developments occurring since late 2012 and assess, through dedicated sections:

- national progress in addressing Research and Innovation system challenges;

- national progress in addressing the 5 ERA priorities;

- the progress at Member State level towards achieving the Innovation Union;

- the status and relevant features of Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3);

- as far relevant, country Specific Research and Innovation (R&I) Recommendations.

Detailed annexes in tabular form provide access to country information in a concise and synthetic manner.

The reports were originally produced in December 2013, focusing on policy developments occurring over the preceding twelve months.

ACKNOWLEDGMENTS AND FURTHER INFORMATION

This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). [ERAWATCH](#) is a joint initiative of the European Commission's [Directorate General for Research and Innovation](#) and [Joint Research Centre](#).

The Country Report 2013 builds on and updates the 2012 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2013 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions of Susana-Elena Perez, Nick Harrap and Mariana Chioncel from JRC-IPTS. The contributions and comments from Diana Ognyanova - DG-RTD are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the [ERAWATCH website](#). Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

Copyright of this document belongs to the European Commission. Neither the European Commission, nor any person acting on its behalf, may be held responsible for the use of the information contained in this document, or for any errors which, despite careful preparation and checking, may appear. The report does not represent the official opinion of the European Commission, nor that of the national authorities. It has been prepared by independent external experts, who provide evidence based analysis of the national Research and Innovation system and policy.

EXECUTIVE SUMMARY

The Republic of Bulgaria has been a Member State of the European Union since 2007. Its economic development has been framed by a Currency Board Arrangement (binding the national currency to the euro) since 1997. Recent development is characterised by slow economic growth. Preliminary GDP data for 2013 indicates a slight pick-up in growth in the second half of the year. Growth was driven by net exports and a surge in public expenditure, whereas household consumption contracted. Annual growth is projected to have reached 0.6% in 2013. This remains well below the estimated potential growth rate of the economy. Going forward, the economic recovery is expected to be more broad-based, with domestic demand forecast to reinforce the export-driven growth momentum. GDP growth is forecast to reach 1.7% in 2014 and 2% in 2015. The recovery is expected to be slow compared to many other converging economies, as a significant population decline (due to ageing and emigration) continues to erode the growth potential. GDP per capita is 47% of EU28 (2012).

In 2012 R&D spending in Bulgaria grew in absolute terms by 17,6% compared to 2010, yet in GDP terms it is not significant - from 0.60% to 0.64%. This is far from the national target of 1.5%. The share of government budget appropriations or outlays on research and development as % of total general government expenditure is 0.71, which is twice less than EU28 -1.42 (2012). The EU funding has become the most important for the country. The recent trends of decentralization of the research system in terms of sectors financed have appeared, but still not in terms of research output. The government sector's share in funding research and development (R&D) decreased from 58.3% in 2008 to 36.6% in 2011. Nevertheless more than 50% of the Bulgarian scientific publications have come from only one research organization of this sector with concentration of national research potential

The **innovation system is operating below its potential**, whether measured by the system's inputs, outputs, or by the contribution of innovation to economic growth. The Global Competitiveness Report 2012-2013 of the World Economic Forum ranks Bulgaria 97th of a total of 144 countries in terms of innovations and excellence in business factors and 92nd under the innovation development indicator. This is not surprising given the low level of funding for R&D and innovation (92nd in private business investment in R&D) and the loose links between education, research organizations and the business, which puts the country at the 117th place in interaction between universities and industry in the field of R&D and innovations. According to the same report, the country is at the 65th place in innovation capacity and 98th in availability of scientists and experts in the field. According to the European Innovation Ranking in 2013, Bulgaria ranks last among the Member States and is a member of the group of the modest (shy) innovators. Relative strengths of Bulgaria were detected under some of the indicators in the field of human resources, intellectual property (the country is at relatively advanced positions (47th) in 'patent pending' and economic effects, and the worst results were in financing and support, networks and entrepreneurship, intellectual property and innovation (creative) results, i.e. in the same areas Bulgaria shows both strengths and weaknesses. This fact determines the innovation system of the country as unbalanced, while the practice of the leading countries in terms of innovation shows that a balanced innovation system is a prerequisite for success.

The latest R&I policy developments are affected by the elections of a new Parliament and respectively – Government and their will to contribute to a better R&I performance of the country. They concern the following initiatives:

1. Ministry of education and science, taking into account the exceptional interest of the scientific community on important issues related to the development of research, open debate on: National strategy for Scientific research – February, 2014; Rules for the FUND “Scientific Research” – February, 2014; Law on Higher education - March, 2014; Road map for research infrastructure development – November, 2013; draft of an operational programme (OP), called “Science and Education for Smart Growth 2014-2020” (version 1.11.2013). Some of the tangible goals laid down in this OP include: a gradual increase of R&D spending in Bulgaria up from the current level (0.64%) to 1.5% of GDP by 2020, a decrease in the rate of schools dropouts to 11%, and an increase of the number of people with a university degree in the age group 24-30 up to 36%.

2. Ministry of economy and energy has opened a debate on: National strategy for smart specialization – draft, November, 2013; draft of the OP “Innovation and competitiveness” (version 8.10.2013), which is directed to the achievement of dynamic competitive development of the economy, based on the innovations, optimization of the manufacturing chains and sectors with high added value.

Main structural challenges that face national R&I policy in 2013 could be summarised as follow:

- *Overcoming low R&D intensity and increasing attractiveness of research carrier.* From 2000 there is established a clear upward trend in the total R & D funding . However, the R & D intensity almost does not change and remains one of the lowest levels in the EU.
- *Definition and subordination of funding priorities.* The growth of foreign R & D investment in the business sector from 2010 is accompanied by the withdrawal of the state investment in R & D
- *Increasing effectiveness of the R&I funding.* Increase over eight times the investments and holding a larger volume R & D in the business sector after 2010 did not result in a significant increase in the share of high-tech exports, or to more requests and registration of intellectual property. Effectiveness of R & D investment in the business is small, and in the public sector they are not prioritized and therefore insufficiently effective.

Assessment of the match between the national priorities and the structural challenges. There is no clear match between the national priorities and the structural challenges..

The national progress towards Innovation Union Commitments. The Government put in significant efforts to meet IU commitments. Most of its activities are in progress.

Main finding of the national progress towards delivery of the ERA. One joint research agenda addressing grand challenges was implemented. Some sources point out that collaborative research activities have increased.

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1 BASIC CHARACTERISATION OF THE RESEARCH AND INNOVATION SYSTEM

1.1 Bulgaria in EU RDI landscape.

The Republic of Bulgaria has been a Member State of the European Union since 2007. It takes 12th place in terms of area, with a population of 7.3 mln., or 1.45% of the EU-27 population. Its GDP per capita in Purchasing Power Standards is slowly increasing and is 47% of the EU-27 average in 2012 (Eurostat, 2013). The country is under a Currency Board Arrangement (binding the national currency to the euro) and is characterized by an open market economy, moderately developed private sector and relatively small domestic market. In 2009-2011 the economic activity, measured as GDP growth has increased to 1.8%, while in 2012 it is 0.8% (See Table 1.). The slowdown was mainly due to the lower external demand and the corresponding real decline of Bulgarian exports (down by 0.4%). While the export has been the major growth contributor in the previous couple of years, in 2012 the main engine of growth was domestic demand. The final consumption increased with 1.8%, compared to 1.5% in 2011. This growth was formed by a real increase of the households' incomes with 2.5% and a decrease in public consumption by 1.4%. In 2012, for the first time since 2008, a positive trend for the gross fixed capital formation has been registered (0.8%). The high-technology sectors (mainly ICT), remain one of the leading drivers of economic growth. But the share of innovative enterprises that utilise new technological knowledge is increasing mainly due to expanding market share and standardisation requirements. The financial stability and the GDP growth however, have been strong enough factors for the RDI intensity to increase. The lack of a large enough market for Bulgarian innovative products along with the lack of well-defined national RDI policy, coordinated with the EU one, have led to unsatisfactory performance in the EU RDI landscape.

1.2 Main features of the R&I system.

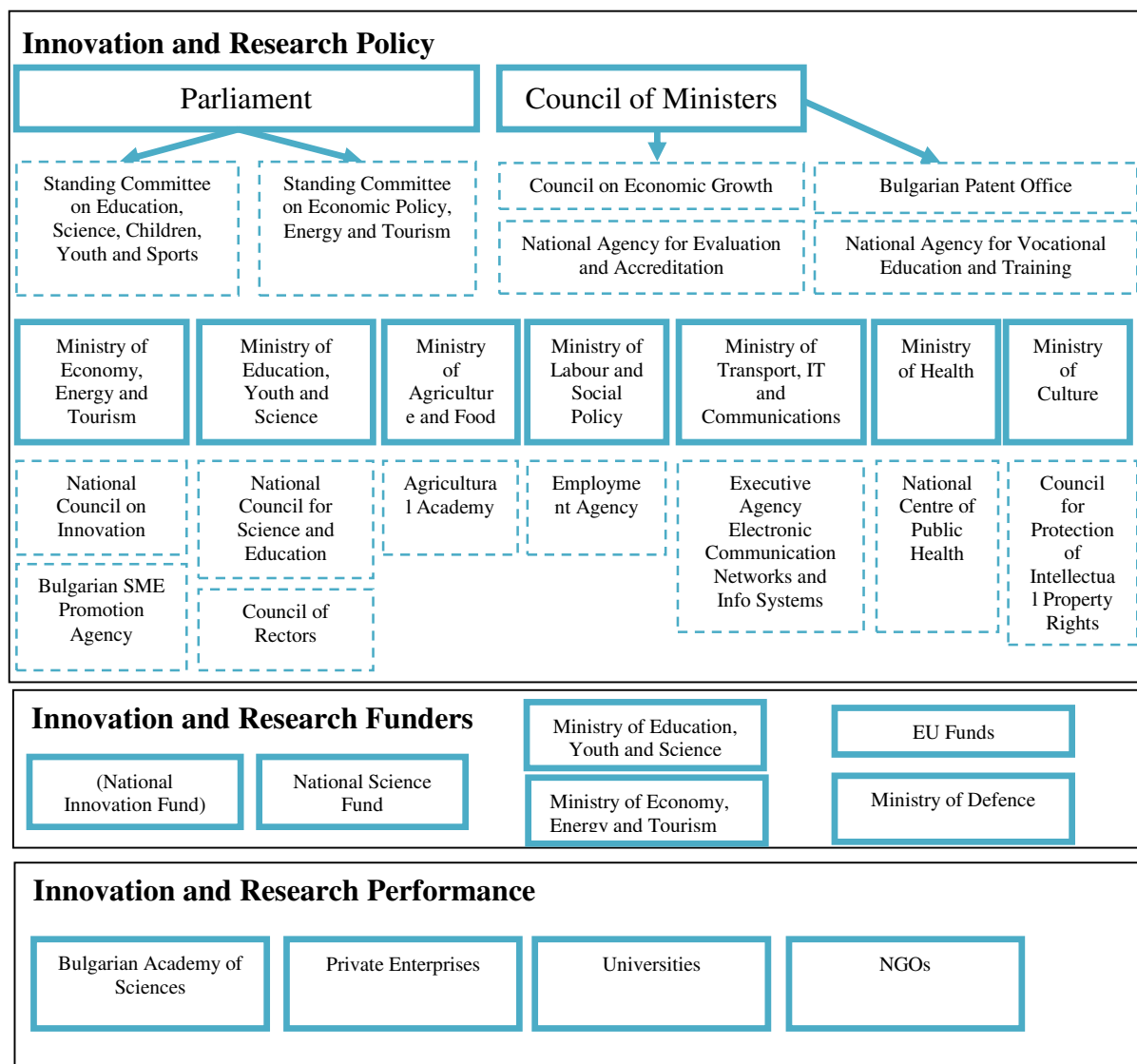
The Bulgarian research system is **characterized by an overall decline** with a lack of a coherent enough national research strategy to underpin research, development and innovation policy. In June 2010, the Bulgarian government adopted a national R&D investment target of 1.5 % of GDP by 2020. R&D intensity has not changed significantly over time: it was 0.51% in 2000, 0.57% in 2011 and 0.64% in 2012. Moreover, the public budget for science remained at 0.3% of GDP, despite a planned increase in absolute terms. Therefore, although R&D expenditure in Bulgaria has been increasing in absolute terms, further dramatic increase would be required if Bulgaria is to reach its 2020 R&D intensity target. The lack of maturity of the links between the main stakeholders in the national system and between them and the European R&I system is another important feature of the country's development during the monitored period. The recent trends in R&I **structure** development are defined by funding from abroad, mainly from European funds. A tendency of decentralization of the research system in terms of sectors financed has appeared, but still not in terms of research output. The government sector's share in funding research and development (R&D) decreased from 58.3% in 2008 to 36.6% in 2011. Nevertheless more than 50% of the Bulgarian scientific publications have come from only one research organization in this sector with concentration of national research potential.

Policy making organisation. The **governance of the national research and innovation system** is presented in Figure 1. The **highest policy-making body** of the Bulgarian research system is the National Assembly of the Republic of Bulgaria (**Parliament**). The Parliament decides the state budget to be allocated for research in the country, as well as its distribution. Standing Committee on Education, Science, Children, Youths and Sports plays an important role. Since 2012 the Parliament has controlled the BAS research output directly. The **Ministry of Education, Youth and Science** designs and carries out national research policy. The **National Evaluation and Accreditation Agency** (NEAA) has introduced criteria compatible with the European standards, these are norms expressed about desired practices, developed and applied for the institutional and programme accreditation, and evaluation of the projects for the opening or transformation of higher education institutions (HEI). A system for the post-accreditation monitoring and control has been worked up, the basis for contacts with similar institutions and associations in Europe has been laid and the first results are in place.

The role of the regions in the governance process. There is a very strong concentration in the Yugozapaden region, mainly in Sofia (except for the production of pesticides, 78% of which is concentrated in Plovdiv). The Smart specialization strategy has been submitted to the EC.

Public R&D institutes, most notably the Bulgarian Academy of Sciences (BAS), are the **major performers of R&D output**. There are no big research performers from the private sector, but since 2010 it is **the major performer of R&D expenditures**.

Figure 1.: The Bulgarian Research and Innovation Systems



1.3 Research and Innovation Policy.

The research and innovation policy goals are strongly connected with implementation of the Europe 2020 Strategy. The public funding in research and innovation is not clearly prioritised and budgeted in the framework of multi-annual plans, which is a barrier to ensure its predictability and stability. The National OP on scientific research for smart growth and OP Competitiveness (2014-2020) are in a process of public discussions, and it is currently not possible to clearly define the main goals and the thematic priorities. Along with the Parliament, adopting the R&D state budget the National Science Fund (NSF) and the National Innovation Fund (NIF) are the **main public research funding bodies**. The National Science Fund programmes are open to all public and private research performers, including private enterprises. The National Innovation Fund programmes were open to enterprises only.

2 RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1 National economic and political context

Since 1997 Bulgarian economy has functioned in the conditions of the currency board, which is a guarantee for its macroeconomic stability. The recent economic development is characterised by slow economic growth - 0.9% for 2013. GDP per capita is 47% of EU28 (2012). Since 2010 the share of government budget appropriations or outlays on research and development as % of total government expenditure has been declining and in 2012 is 0.71, which is twice less than EU28 -1.42. This tendency could be compared with the increasing of the R&D funding from abroad.

In general, the Bulgarian research system is characterized by overall decline with lack of enough coherent national research strategy to underpin research, development and innovation policy after collapsing the major market of its products. The innovation system is operating below its potential, whether measured by the system's inputs, outputs, or by the contribution of innovation to economic growth.. Some steps toward changing the current situation has appeared in 2013 following parliamentary elections and a new government. It is too early to evaluate the impact of their R&I policy from the point of view of achieving the National Strategy for Scientific Research to 2020 (2011) goal to facilitate the development of the Bulgarian Science by making it a factor for economic development based on knowledge and innovation.

2.2 Funding trends

2.2.1 Funding flows

Although R&D expenditure in Bulgaria has been increasing in absolute terms, further dramatic increase will be required if Bulgaria is to reach its 2020 R&D intensity target of 1.5%.

The direct impact of the economic crisis on the GDP growth and R&D expenditure is not significant since 2010. The GDP growth is small, but positive; the R&D intensity is almost the same. The GERD as Euro per capita has been increasing up to 34.6 but is still far below EU -27 averages (525.8) in 2012. The crisis affected the R&D funded by business enterprise sector, with efforts being more than ten times less comparatively to the EU -27 in 2011. During the last four years the R&D performed by HEIs as % of GERD is declining and in 2012 becomes 8%, which is three times less than EU-27. The same tendency has appeared in R&D, performed by the Government sector, where most of the R&D output has taken place. The competitive public funding for R&D is prevailing the institutional one, if we take into account internal rules for usage and accountability of the state subsidy of the BAS and universities.

The most notable change in Bulgaria's R&D funding structure since 2010 is the increase of the investments from abroad. They have been in the range of 5-8% of total R&D funding for the period 2000-2009. However, due to the inflow of EU Cohesion and Structural Funds, and some private investment in medical R&D, in 2010 and 2011 they reached 39.4% and 43.9% respectively of the total R&D funding. This change in funding has led to increasing R&D performed by the Business Enterprise sector from 30.0% of GERD in 2009 to 61% in 2012, which is almost the same as EU-27. The Government sector has historically been the main research funder and performer in Bulgaria. Now its role is changed. Government budget appropriations or outlays on R&D (GBAORD) have declined in last four years. R&D performed by the Governmental sector is declining sharply – from 55% of GERD in 2009 it becomes 30. R&D funded by Business Enterprise sector is decreasing from 0.16 % in 2009 to 0.1% in 2011, which level is less than EU27average, which is 1.12. R&D performed by HEIs (% of GERD) is very low – 14% in 2009, and is declining to 8%. The R&D performed by PROs in the country (% of GERD) could be neglected.

Table 1. Basic indicators for R&D investments

	2009	2010	2011	2012	EU27 (2012) *
GDP growth rate (percentage change on previous period)	-5.5	0.4	1.8	0.8	-0.4
GERD (% of GDP)	0.53	0.6	0.57	0.64	2.06 e
GERD (euro per capita)	24.7	29	29.8	34.6 p	525.8 e
GBAORD - Total R&D appropriations (€ million)	117.143	96.611	94.171	99.466	86309.497
R&D funded by Business Enterprise Sector (% of GDP)	0.16	0.1	0.1	:	1.12 (2011)
GERD funded by Business enterprise sector (% of GERD)	30.2	16.7	16.9	:	54.6e (2011)
R&D performed by HEIs (% of GERD)	14	12	10	8	24
R&D performed by Government Sector (% of GERD)	55	37	36	30	12
R&D performed by Business Enterprise Sector (% of GERD)	30	50	53	61	63
Share of competitive vs. institutional public funding for R&D in % (own calculations)	68	64	65	61	85
Venture Capital as % of GDP (Eurostat table code tin00141)	0.018	0.009	0.001	0.000	0.025
Employment in high- and medium-high-technology manufacturing sectors as share of total employment (Eurostat table code tin00141)	3.8	3.2	3.3	3.8	5.6 (2011)
Employment in knowledge-intensive service sectors as share of total employment (Eurostat table code tsc00012)	27.1	27.7	28.9	29.1	38.9

*The EU27 average data.

Table1-a Indicators for R&D investments: Turnover from Innovation as % of total turnover

	2004	2006	2008
EU (27 countries)	13.7	13.4	13.3
Belgium	12.9	9.3	9.5
Bulgaria	12.5	10.3	14.2

Source: Eurostat table code tsdec340

An important indicator for the R&D output is the ratio of turnover from products new to the enterprise and new to the market as a % of total turnover, is based on the Community innovation survey, which covers at least all enterprises with 10 or more employees, and where innovation is a new or significantly improved product (good or service) introduced to the market or the introduction within an enterprise of a new or significantly improved process. The figures available (See Table 1-a) show that for the period before the crisis Bulgaria performed as EU27.

2.2.2. Funding mechanisms

2.2.2.1 Competitive vs. institutional public funding

The competitive R&I funding mechanisms are prevailing the institutional ones since 2010. The *inflow of EU Cohesion and Structural Funds since 2010 has increased the share of competitive public funding* for R&D considerably. The allocated ERDF and Cohesion Fund support for the 2007-2013 period amount to €310.6m for RTDI and linked activities and €292m for Support for innovation in SMEs (DG Regional Policy).

The *main direct competitive funding mechanisms for national public R&D funding allocation* are those of the National Innovation Fund (NIF) and the National Science Fund (NSF). Due to considerations of overlapping with EU funding programmes, NIF has not distributed any funds since 2008, when it reached a budget of €10.3m. NSF's budget peaked in 2009 (€51.1m), but Government cuts in 2010 have substantially restricted it to €13m. The public debates regarding the mechanism for NSF's distribution of public money are still taking place in 2013.

A specific feature of Bulgarian public funding mechanisms is that the block funding, available for R&D in Universities and BAS, is project based and competitive for researchers. The R&D funding available, according to the Law is 10% of total state subsidy for any university (in spite of there are some fluctuations in the practice). Similar is the state of the art in the BAS, based on internal rules, delivering the right to allocate the subsidy to its General assembly, and to be approved by the Board of trustees. According to the BASs annual reports a half of its budget is allocated for projects, approved to be subsidized by institutes' scientific councils. The allocation of the state subsidy among 42 institutes is based on recent research performance and results of international evaluation.

In conclusion, it could be summarized that the main funding mechanisms, assessed as a **balance between the main funding streams, are dominated by public competitive funding** (from national and mostly European sources). Tax incentives for R&D expenditures have been limited and have not attracted private enterprises.

2.2.2.2 Government direct vs indirect R&D funding¹

The government direct R&D funding is relatively more important than government indirect one. The balance direct / indirect R&D funding has not been changed in the last three years.

The evolution regarding innovation funding such as venture and seed capital is negative. The venture capital has no role now. As a percentage of GDP it is declining from 0.018 in 2009 to 0 in 2012.

There are some attempts but still there are no funding streams covering the entire value creation chain from fundamental research through to market innovation in one single programme.

2.2.2.3 Thematic versus generic funding

About half of national funding distributed by NSF, and more than two third by BAS has a thematic focus. NSI data for the period 2000 – 2011 shows that R&D spending in real and in growth terms has been highest in the technical and natural sciences, followed by the agricultural sciences. In 2010 and 2011 however the medicine and health science received the most R&D funding. Government spending dominates the natural sciences, therefore, of primary importance in R&D spending growth. In contrast, R&D expenditures of the business enterprise sector in technical sciences are greater than those in the public sector. For example the GBAORD by socio-economic objectives favors the agriculture (15.3%), and education (12%), followed by the general advancement of knowledge in the universities (10.4% of the GBAORD), (NSI, 2011)

The way the R&I resource allocations is taking place reflect the **grand challenges** indirectly.

An overview of the most important policy documents provides guidance as to the potential *thematic focus* of the Bulgarian research policy, once financing becomes more readily available. The National Strategy for Scientific Research for the Period 2005-2013 gives preference to applied research as opposed to basic research, as do more general policy documents such as the National Strategic Reference Framework. All these documents are careful to spell out that the distinction between applied and basic research is rather blurred. The National Strategy for Scientific Research for the Period 2005-2013 outlines the following priority thematic areas: national identity and Bulgarian cultural heritage; information technologies; new materials and technologies; agro- and biomedical research and technologies.

Among national policy documents related to *sectoral policies* The National Programme for Reforms 2007-2009 has come up with a long list of priorities: *ICT, genetics, medicine, biotechnologies, machine building, energy-saving technologies, and nanotechnologies*. The next National Program for Reforms 2008-2010 focuses on the improvement of the legislation and financing mechanisms in the research and science area. The government's position on the Europe 2020 Strategy (June 2010), based on analysis of the Ministry of the Economy, Energy and Tourism, includes some

¹ **Government direct R&D funding** includes grants, loans and procurement. **Government indirect R&D funding** includes tax incentives such as R&D tax credits, R&D allowances, reductions in R&D workers' wage taxes and social security contributions, and accelerated depreciation of R&D capital.

economic sectors for *structural specialisation of the Bulgarian economy*, such as *information technologies, electronic components, machine-building, medicinal and optical equipment production, etc.*

There are not enough effective policies to strengthen the links between public R&D institutions and industry. Bulgaria does not have any specific tax, public procurement or other public policy measures to stimulate private R&D spending. The main driving factors are expanding market share and standardisation requirements. The Bulgarian economy continues to have a low technology profile; however, the existing high-technology sectors, including ICT, remain one of the leading drivers of economic growth.

The BAS, in its capacity of National research centre promotes its own policy towards the definition of thematic RD priorities. Its research agenda is developed according to the goals and priorities, defined in “Strategic Goals and Priorities of the Bulgarian Academy of Sciences Scientific Policy in the 2009 - 2013 Period“, adopted by its General Assembly. (See: [BulgarianAcademyofSciencesScientificPolicyinthe2009.pdf](#)). The document defines three policy areas addressing challenges to country development: Science as the main driving force in the development of knowledge based national society and economy; Scientific potential and research infrastructure as a part of the European Research Area; and National identity and cultural diversity in Europe and in the world. According to these policies thematic priorities of the research agenda of Scientific councils at autonomous BAS institutes are defined. The results achieved are reported to the Parliament.

It could be summarized that at aggregate level the balance between generic and thematic/sectoral R&D policies needs further improvement.

2.3 Research and Innovation system changes

In 2012 R&D spending in Bulgaria grew in absolute terms by 17,6% compared to 2010, yet in GDP terms it is not significant - from 0.60% to 0.67%. This is far from the national target of 1.5%. In 2011, the ratio between R&D spending by businesses and R&D public one in total R&D spending in Bulgaria was 53:47, while for EU27 this indicator was 62:38. Total R&D spending focuses primarily in the area of medicine (44%), natural sciences (22%) and technology (19%) (NRP 2013).

The most notable change in Bulgaria’s R&D expenditures’ structure since 2010 is the increase of the investments from abroad. They have been in the range of 5-8% of total R&D expenditures for the period 2000-2009. However, due to the inflow of EU Cohesion and Structural Funds in 2010 and 2011 they reached 39.4% and respectively -43.9% of all R&D expenditures (NSI). Now the Government is less important for funding and performing R&D&I. Government investment are dropping dramatically for the period 2008-2011 according to the State of Innovation Union report(2012). The EU funding has become the most important for national R&I system. The Enterprise Business sector has become prevailing one in R&D performance. But the RDI investments are predominantly public - 86.496 m. euro (Gov.+HEI) and 37.175 m. euro (business) in 2011 (Eurostat)

The Bulgarian scientific publications have become more visible. Appearance in Thomson

Reuters/ ISI Web of Science List is as follow: a) in Science as of January 2013 are 10 journals; b) in Art & humanities – as of October, 2013 -1.

At the level of R&D performers a significant change was occurred in 2012 after the change of the Law for BAS on 12 of April, 2011. A board of trustees was established at the BAS governing structure, which allows public influence to its research agenda. With the same change of the Law a significant change occurred at political level with obligation the Annual reports of BAS to be discussed and accepted by the Parliament. For the first time in 2012 the Parliament discussed and accepted the research outputs of the Academy. (BAS,2011).

2.4 Recent Policy developments

To boost activities in its innovation system, Bulgaria is undertaking steps to improve the coherence of its innovation policy. In 2013, a draft for a Law on Innovations was prepared. It is aimed to adopt a modern organisation of innovation processes and eliminate the existing imbalances in the methods of financing research and innovation in enterprises. A new Innovation Strategy for Smart Specialisation has been submitted on 11th of December, 2014. In the framework of the Partnership Agreement concerning the use of the Structural Funds and the Cohesion Fund, Bulgaria has proposed two mutually complementing operational programmes in the R&D area for the period 2014-2020: “Innovations and Competitiveness“ and „Science and Education for Smart Growth“.

OP „Science and Education for Smart Growth“ is seen as an important contribution to reviving the poorly funded Bulgarian science and education, which has been left behind in the 2007 – 2013 programming period. Some of the tangible goals laid down in the new OP include: a gradual increase of R&D spending in Bulgaria up to 1.5% of GDP by 2020, a decrease in the rate of schools dropouts to 11%, and an increase of the number of people with a university degree in the age group 24-30 up to 36%. The envisaged five priority axes of the OP and their associated more concrete measures are:

1. Scientific research and technological development
 - Modernization of scientific equipment
 - Supply of modern ICT technologies for digitalization of scientific and educational content, data storage, and maintenance of electronic portals for scientific results publication
2. Education for employment, mobility and entrepreneurship
 - Strengthening of linkages between university education and business sector
 - Support for qualification and mobility of the human resources employed in the educational sector
3. Educational environment for social inclusion
 - Improved access to pre-school and school education
 - Integration of children from ethnic minorities and reintegration of children dropping out of the educational system
 - Support for children with special educational needs
4. Encouragement of education, qualification and life-long learning

- Improved quality of and access to university education
- Improved quality of and access to pre-school and school education
- Improved conditions for life-long learning

5. Educational infrastructures

- Construction, reconstruction and renovation of educational infrastructure different to activities falling under Operational Programme “Urban Development”
- Introduction of unified ICT systems and equipment in the field of conventional and professional education.

The second draft OP - "Innovation and competitiveness 2014-2020" is directed to the achievement of a dynamic competitive development of the economy, based on the innovations, optimization of the manufacturing chains and sectors with high added value.

To achieve this goal, the following two priority directions have been defined for support:

1. Entrepreneurship, export and production potential as a base for accelerated growth including
 - A) Technological development and innovations (smart— growth) and
 - B) Competitiveness and productivity of the enterprises, incl. SME (fast growth);
2. Green and efficient economy as a guarantee for sustainable growth, including:
 - C) Green economy and resource efficiency;
 - D) Energy technologies and energy efficiency.

In order to support and facilitate the programming process in Bulgaria for the period 2014-2020 EC presented the Position of the Commission Services on the development of Partnership Agreement and programmes in Bulgaria for the period 2014-2020. Together with the Country Specific Recommendations, the Position Paper underlines five complementary and mutually reinforcing funding priorities the Commission would like to co-finance with ESIF funding in Bulgaria for the next programming period, namely:

1. Increasing labour market participation through improved employment, social inclusion and education policies;
2. Innovation-friendly business environment;
3. Modern infrastructure for growth and jobs;
4. Environment-friendly and resource-efficient economy;
5. Strengthening capacity of public administration, governance and judiciary.

R&I policy developments in the country are also related to:

- The Statement of the Commission services regarding the development of the Partnership Agreement and Operational Programs in Bulgaria for the period 2014-2020 which emphasizes the redirection of the focus of the expenses to scientific-research activity and innovations; support of the small and medium-sized enterprises; quality education and training; encouraging quality employment and social cohesion, thus ensuring high efficiency; integration of the objectives, related to the climate change and transition to resource efficient low-carbon emission economy.
- Innovation Strategy for Smart Specialization of the Republic of Bulgaria by 2020, which develops in depth, one of the priority destinations of the NDP: Bulgaria 2020 – Support of the

innovation and investment activities for the increase of the economy competitiveness. The project for the innovative strategy for smart specialization

Ministry of Education and Science, taking into account the exceptional interest of the scientific community on important issues related to the development of research, has opened debate on: National strategy for Scientific research – in February, 2014; Rules for the FUND “Scientific Research” – February, 2014; Law on Higher education – March, 2014; Road map for research infrastructure development – October, 2013.

2.5 National Reform Programme 2013 and R&I

The National Reform Programme (NRP) has discussed the R&I target and measures to boost innovation activities, personnel employed in R&D, the role of SMEs and of FP7.

It was reported that to boost activities in its innovation system, Bulgaria is undertaking steps to improve the coherence of its innovation policy:

- In 2013, a draft for a Law on Innovations was prepared which will adopt a modern organisation of innovation processes and eliminate the existing imbalances in the methods of financing research and innovation in enterprises. - By the end of 2013, a new Innovation Strategy for Smart Specialisation was submitted to the EU. It defines the national and regional priorities in the area of innovation. (see 2.7.).

- To foster the interest of young people who are completing their doctoral studies, and hence improve the age profile of people engaged in R&D, as from 2012, funding has been made available for one-month internships of doctoral candidates in high-tech R&D centres and infrastructure

- In 2013, along with the development of the Sofia Techno Park, young enterprising talent, scientists and R&D units with ideas whose innovative potential is high have been identified and offered entrepreneurship training as part of the project.

- In addition to improving SMEs access to financing the innovative potential of SMEs is fostered by the development of pro-innovative infrastructure and business incubators and direct support for the commercialisation of innovative products under OPDCBE.

- Evaluated participation in the European Framework Programmes for research, technology development and demonstration activities. For the period 2007-2012, Euro 100 million was absorbed. Bulgaria is well positioned in some of the other on-going initiatives of the European Research Area – the European Cooperation in Science and Technology programme (COST), the schemes under Joint Research Centres, and the schemes for coordination of national research programmes. As of the end of 2012, Bulgaria has taken part in 140 actions and 251 projects under the COST initiative, it has signed cooperation agreements with 14 countries, and agreements with another 3 countries will be signed. Under the Seventh Framework Programme, 580 contracts were signed at a total value of BGN 158.4 million. Bulgaria’s success rate is 16.6%, compared to an EU27 average of 21.8%. Financing has been provided to 130 bilateral cooperation projects for the period 2007-2012. Preparations are underway of the document package for the “Horizon 2020”, and the first information events have already been held.

2.6 Recent evaluations, consultations, foresight exercises

The only international evaluation and consultation of research organisation was undertaken by the BAS. This evaluation is important as the reform, taking place in the BAS during the period 2010-2012, was based on the results, presented in the report: “Research at the Bulgarian Academy of Sciences. A Report by the 2009 Science Review Committee” (BAS 2009-2). The Review Committee has come to the unambiguous conclusion that the majority of BAS Institutes perform valuable research as judged by international standards; some research groups operate at the forefront worldwide. The overall evaluation is that research in the BAS is an impressive achievement, considering the particularly difficult circumstances for research in Bulgaria. Institutes that perform remarkably well in international comparison, produce research of the highest societal relevance for Bulgaria and the wider region. However, that this relatively good performance results largely from investments in the past and cannot be sustained without a considerable effort on the part of both BAS and the Bulgarian government. The effort required is primarily a matter of providing better funding to BAS. As it was not the case and further drastic reorganisation aimed at matching the ambitions and the scope of the research at BAS with the financial resources available has taken place. The change after evaluation (2011) was directed towards programme oriented organization of research activities in the BAS (see: http://www.bas.bg/fce/001/0342/files/KATALOG_NAUKA_ENG_curves.pdf).

2.7 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3)

European Commission provide specific guidelines for regions and Member States on how to develop and implement strategies for research and innovation strategy for smart specialization in the form of methodological and practical guidance. Following them in the Decision of the Council of Ministers № 668/06.08.2012, as supplemented and amended. With CMD № № 102 and 597 of 2013, the Ministry of Economy and Energy is determined to be a leading institution in the development of a new innovation strategy for smart specialization. For this purpose was established organizational structure: Prime - Minister of Economy and Energy; board with members - the National Innovation Council to MEET in which members are deputy ministers from relevant ministries, representatives of business organizations, NGOs, representatives of the Bulgarian Academy of Sciences, the Council of Rectors of universities are and the like; Working Group - experts from relevant ministries and representatives of the Council for the development of the country.

For the realization of this responsible task of July 26, 2012 was signed a partnership agreement with the World Bank experts to prepare a comprehensive analytical report with recommendations to be part of the future strategy document. World Bank prepared and submitted for discussion and comments a report to prepare an innovation strategy for smart specialization.

In April, 2013 the Ministry of Economy, Energy and Tourism developed the first version of the strategy. In the process of preparation and development of the Strategy the following materials were taken into account: Innovation in Waste Innovation in Water, Sustainable growth – environment, Policy in ICT – MTTTC, Information on energy efficiency – MEE, Creating an innovation-friendly business environment for SMEs – MEE.

On July 27, 2013 an extended meeting of the National Innovation Council was held, where besides the members of the Council other business representatives, business organizations, academics and NGOs were invited.

On December 11, 2013 the first draft Innovation Strategy for Smart Specialization of Republic of Bulgaria (2014-2020) was sent to the Commission for prior consultation. (See: MEE 2013).

This document has displayed two main strategic objectives, namely:

1. Increasing the competitiveness of the economy by providing a stimulating environment for innovation and research created by human resource with more specialized and better knowledge in ubiquitous use of information and communication technologies.

2. Efficient use of resources, reduce carbon emissions and prevent the loss of biodiversity, providing optimum levels present and future needs of the population.

Special emphasis is placed on industrial sectors with export orientation and employment, as well as sectors with growth potential to address the challenges of sustainable development.

Five priorities for development are formulated in general terms about the achievement of key objectives:

- Effective and coordinated management of innovation processes;
- Strengthening of the innovation system by building a modern innovation and scientific infrastructure, enhancing human capacity to the needs of science and industry and the introduction of specific financial instruments support;
- Support for digital growth and e-governance;
- Introduction of sustainable patterns of production and consumption that are tailored to the capacity and opportunities for ecosystem restoration and do not cause environmental degradation;
- Introduction of innovative methods and ideas based on renewable and not of exhaustible natural resources so that each region to benefit from its natural capital.

The strategy contains an action plan to ensure implementation of the Strategy. It will develop technology roadmaps that will determine the products and technologies with competitive advantages. By the end of 2015 the innovative potential of the regions of planning will be updated. It is projected the dialogue with all stakeholders, especially with local authorities and local businesses to continue.

In conclusion it could be summarised that there is a formal, but not mature enough, link between the draft of Innovation strategy for smart specialization and the programming documents for the 2014-2020 EU funding cycle (Partnership Agreement drafts and Operational Programme). The action plan to implement RIS3 is in a process. The financial requirements, including for structural fund co-financing are not enough detailed. Measures to stimulate private

investment are in the core of the draft, but need further clarification. The RIS suggests adequate monitoring and evaluation mechanism capable of changing the strategy's approach if necessary.

2.8 Policy developments related to Council Country Specific Recommendations

The recommendations on Bulgaria's 2013 national reform programme and Council opinion on Bulgaria's convergence programme for 2012-2016 of 19 June 2013 do not explicitly concern R&I policy. Those which are related to such policy are connected with:

- taking further steps to improve the business environment, by cutting red tape, implementing an e-government strategy and implementing the legislation on late payments; improving the quality and independence of the judicial system and fight corruption more effectively; improving the access to finance for SMEs and start-ups;
- accelerating the absorption of EU funds; ensuring sound implementation of public-procurement legislation by extending ex-ante control by the Public Procurement Agency to prevent irregularities;
- strengthening the independence of national regulatory authorities and the administrative capacity in particular in the energy and transport sectors, as well as for waste and water management; removing market barriers, quotas, territorial restrictions and regulated prices and complete the market design by setting up a transparent wholesale market for electricity and natural gas; accelerating electricity and gas interconnector projects and enhance the capacity to cope with disruptions; stepping up efforts to improve energy efficiency.

3 PERFORMANCE OF THE NATIONAL RESEARCH AND INNOVATION SYSTEM

3.1 National Research and Innovation policy

The national research and innovation policy faces the challenge to improve the unsatisfactory level of national research and innovation system performance. Bulgaria is one of the countries with the lowest R&D intensity in the EU and ranks the lowest in the EU on private R&D investment as a share of GDP. Based on the average innovation performance, it falls into the group of the modest innovators well below that of the EU average. Bulgaria ranks bottom in the European Union's 2013 scoreboard of innovation performance, having been at or near the lowest ranking every year since 2008. Bulgaria now has ranked last in the 2008, 2012 and 2013 scoreboard, placing second-bottom in 2009 and fourth from last in 2010 and 2011.

In this respect the progress of the R&I policy is insufficient. Since the launch of the Europe 2020 Innovation Union flagship initiative in 2010 the innovation index of Bulgaria has worsened the most dramatically (-18.7%). There is a marked difference in the change in five year growth performance in the 2006-2010 period as captured in the IUS 2010 and that in 2008-2012. Within the modest innovators growth has plummeted from almost 11% to just 0.6% for Bulgaria. Relative strengths are in Human resources, Intellectual assets and Economics effects. High growth is observed for Community trademarks and R&D expenditure in the business sector. A relatively strong decline is observed for Non-R&D innovation expenditures and Venture capital investments. Growth Relative weaknesses are in Open, excellent and attractive research systems, Finance and support, Firm investments, Linkages & entrepreneurship and Innovators. (IUS 2013).

Bulgaria's national RTDI policy is a supply side one. In order to achieve the objectives of the ERA pillars the country needs to focus on demand side, setting more precise guidelines for cross-border collaboration, as well as elaborate and implement effectively a number of support measures. The Innovation Union Competitiveness report 2011 for Bulgaria notes that there can be potential to raise the quality of the scientific production, should the necessary reforms be adopted.

According to IUS 2013 national human resources are insufficient (See Table 2). New doctorate graduates (ISCED 6) per 1000 population aged 25-34 are 0.5, which is 3 times below EU27. The percentage of the population aged 25-64 having completed tertiary education is 27.3, which is below EU27 (34.6). There are some problems with the openness and attractiveness of research system. The international scientific co-publications per million population is 205, which is two third of the EU 27. Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country is 2.62, which is less than performed in IUS 2011 (3.59). It is far below EU27- 10.9. Finance and support, measured as R&D expenditure in the public sector as % of GDP is 0.26, which is three times below EU27. Firm activities,

estimated as R&D expenditure in the business sector as % of GDP, are 0.30 which is four times bellowing EU27 (1.27). Linkages in IUS 2013, measured as Public-private co-publications per million population, are 4.10, almost twice more than in IUS 2011, but thirteen times less than EU27 (52.8). Intellectual assets, measured as PCT patents applications per billion GDP (in PPS€), are 0.34, ten times less than EU 27 (3.9). PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health) are 0.12, while for EU27 they are 0.96. The outputs - economic effects, are also insufficient comparatively to EU 27. Contribution of medium and high-tech product exports to trade balance is - 4.78, while in EU27 it is 1.28. Knowledge-intensive services exports as % of total service exports is 26.84, while in EU27 is 45.14. License and patent revenues from abroad as % of GDP are 0.03, and in EU27 – 0.58.

Table 2. Assessment of the Performance of the National research and Innovation System

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	0.5
Percentage population aged 25-64 having completed tertiary education	27.3
Open, excellent and attractive research systems	
International scientific co-publications per million population	205
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	2,62
Finance and support	
R&D expenditure in the public sector as % of GDP	0.26
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	0.30
Linkages & entrepreneurship	
Public-private co-publications per million population	4.10
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	0.34
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	0.12
OUTPUTS	
Economic effects	
Contribution of medium and high-tech product exports to trade balance	-4.78
Knowledge-intensive services exports as % total service exports	26.84
License and patent revenues from abroad as % of GDP	0.03

Source: Innovation Union Scoreboard 2013

The National Strategy of Scientific Research to 2020 strategy reviews the state of the national R&I system and *lists nine top challenges*. Among them are: Sustainability and predictability of R&D investments in pursuance of the national R&D target for 2020; Rigidity of the institutional structure of the public scientific system; The ageing structure of scientific personnel deteriorates further as the structure and incentives in place do not stimulate new entrants to the system; The disproportionally small share of competitive funding in public budgets for scientific research; Lack of mobility schemes in the public and the private sector; The absence of competitive funding of doctoral studies and need of introduction of project financing of the doctoral studies under projects of interest for the hosting institution; Lack of coherence between the education, science and innovation policies; Underdeveloped innovation infrastructure; Limited instruments at national level in support of innovation.

The Innovation union progress on the country level presents a synthesis of research, innovation and competitiveness performance in Bulgaria (see Table 2a). It is related to knowledge

investment and input to performance or economic output throughout the innovation cycle. The indicators show thematic strengths in key technologies and also the high-tech and medium-tech contribution to the trade balance. The table includes a new index on excellence in science and technology which takes into consideration the quality of scientific production as well as technological development. The indicator on knowledge-intensity of the economy is an index on structural change that focuses on the sectoral composition and specialisation of the economy and shows the evolution of the weight of knowledge-intensive sectors and products and services.

Table 2a. Assessment of research, innovation and competitiveness performance in Bulgaria

Research
<i>R&D intensity</i> 2011: 0.57% (EU: 2.03%; US: 2.75%) 2000-2011: +1.06% (EU: +0.8%; US: +0.2%)
<i>Excellence in Sc&T</i>
2010:24.65 (EU:47.86; US: 56.68)
2005-2010: +3.4% (EU: +3.09%;US: +0.53)
Innovation and Structural change
<i>Index of economic impact of innovation:</i> 2010-2011: 0.234 (EU: 0.612)
<i>Knowledge-intensity of the economy:</i> 2010:29.45 (EU:48.75; US: 56.25) 2000-2010: +3.65% (EU: +0.93%; US: +0.5%)
Competitiveness
<i>Hot-spots in key technologies:</i> Agriculture, Nano- and Biotechnology, ICT and Energy
<i>HT + MT contribution to the trade balance:</i> 2011: -4.78% (EU: 4.2%; US: 1.93%)
2000-2011: n.a. (EU: +4.99%; US:-10.75%)

3.2 Structural challenges of the national R&I system

In this respect the main structural challenges in the area of innovation and science could be defined on the base of a summary of the analyses of the National scientific strategy and other national policy documents, on the Council opinion of June 2013, as well as benchmarking the performance against EU average, and available economic analysis in the country. The greatest among them are:

- **Overcoming low R&D intensity and increasing attractiveness if research carrier.**

The national R&D spending goal of 1.5 % of GDP by 2020 is not on-track and out of reach, as R&D intensity has to perform at least +1.6% annual growth since 2000 comparatively to real level not higher than 0.6%. R&D expenditure in the public sector as % of GDP is 0.29, which is more than twice below the efforts of EU27 average – 0.76. The low R&D intensity, low salaries of the R&D staff and brain drain are reasons for decreasing attractiveness of the research career.

- **Subordinating country specific thematic and public funding R&D priorities & ERA participation priorities.**

The growth of foreign R & D investment in the business sector from 2010 is accompanied by withdrawal of the state to invest in R & D in the government sector. The growth of foreign R & D investment in the business sector from 2010 is accompanied by withdrawal of the state to invest in R & D in the government sector and the business - to self-finance R & D. There is many policy documents with different priorities recommended, but not subordinated. National thematic and sectoral priorities for public R&D funding at EU, national and regional level are clearly defined. They are not subordinate to innovation policies aimed at increasing domestic and

foreign demand for nationally based research output. There is no coordination between science, technology and innovation policy. The existing e innovation strategy is under discussion.

- **Reducing fragmentation of R&D system - policy coordination and strategic planning.**

Reduction of the number of universities and better planning and coordination of research topics between them and in the national research centres as the BAS and Academy of agriculture could contribute to improvement of R&D system efficiency.

- **Strengthening R&I in universities and public research organizations.**

The problem is that strengthening universities and developing a strategy to engage higher education institutions in innovation activities appears in several policy documents, but their big number is an obstacle to concentrate national efforts and reach significant results. Strengthening R&D in public research organizations concerns overcoming decapitalisation of existing national R&D centers along with increasing attractiveness of scientific carrier. Overcoming this challenge will lead to decreasing brain drain. The concentration and strengthening of the research in few universities and research centres could improve their innovation potential and efficiency of links with business.

- **Intensifying links between education, research and business and avoiding bottlenecks for start-up companies and innovative SMEs. Increasing effectiveness of the R&I funding.**

The links between education, research and business are sporadic and weak, and thus the human potential is not effectively used for achieving social and economic objectives. Along with this public financial instruments and guarantees for young and innovative enterprises are still in the early stage of implementation and their effect is expected to be seen. An increase of over eight times the investments and holding a larger volume R & D in the business sector after 2010 did not result in a significant increase in the share of high-tech exports, or to more requests and registration of intellectual property. Effectiveness of R & D investment in the business is small, and in the public sector they are not prioritized and therefore insufficiently effective

3.3 Meeting structural challenges

The ability of the policy mix in place to effectively and efficiently tackle the structural challenges faced by the research and innovation system is not sufficient, but is improving. The new State budget for 2014 and the two OP which are in process suggest potential solutions for addressing specific national structural challenges. How effective has such policy action been is presented in Table 3 below.

There is no evidence from both policy level evaluations and broader reviews/analyses on the impact and outcomes of policies on the structural challenges. The recent evidence on the effectiveness of policy arising from evaluations of the BAS is provided in the same Table 3.

It could be summarised the policy mix is not well articulated for addressing the challenge.

Table 3. Assessment of the effectiveness of the specific policies to address the structural challenges

Challenges	Policy measures/actions	Assessment in terms of appropriateness, efficiency and effectiveness
Overcoming low R&D intensity and increasing attractiveness of research carrier (brain drain; low salary of the R&D personnel)	Accepted Acts for Annual state budget 2013 & 2014.	(+) Increased subsidy for R&D (-) Insufficient public funding in nominal terms and trend towards increased utilisation of EU funds for innovation support at the end of the programme period could lead only to furthering changes in the R&D structure of the national system, but not to overcoming low R&D intensity. Appropriateness and effectiveness of state budgets require clear prioritisation and coordination between different sources of public R&D funding, and measures for increasing foreign and domestic market demand for national research product. (-) The low level of salaries for researchers, more concretely in the main research organisation – BAS, affects increasing the brain drain. Strengthening R&I in public research organizations concerns also overcoming decapitalisation of existing national R&D centres and increasing the salaries of R&D employed, along with establishment of “Sofia-tech” technology park as a core R&I hub for the whole country and set the conditions to attract leading international and local scientists
Subordinating country specific thematic and public funding R&D priorities & ERA participation priorities.	Administrative attempts to coordination of priorities and measures for new OP “Science and Education for Smart Growth 2014-2020” and “Competitiveness and Innovation” Implementation of the changes of the Law on the BAS (2011)	(-) National thematic and sectoral priorities for public R&D funding at EU, national and regional level are neither well defined, nor subordinated with a policy for increasing domestic and foreign demand for national research output. (+) Introduced advisory board to the governance structure of the BAS, which allows influencing its research programme, as well as annual reporting the results of activities to the Parliament, which ensure their appropriateness.
Reducing fragmentation of R&D system- policy coordination and strategic planning	No measures.	The efficiency of activities for R&I administration is not changing.

Challenges	Policy measures/actions	Assessment in terms of appropriateness, efficiency and effectiveness
Strengthening R&I in universities and public research organizations	<p>Evaluation measures set in the new National Strategy of Scientific Research to 2020 (2011)</p> <p>Introduced university rating system (2010)</p> <p>Change of the Law for BAS (2011).</p> <p>Availability of EU-financed operational programmes to develop human resources.</p> <p>Adopted new Law on the Development of the Academic Staff (May 2010).</p> <p>Push for increasing the national budget financing of education.</p> <p>Availability of EU-financed operational programmes to develop human resources.</p>	<p>The evaluation of research in the university sector is still performed irregularly. The regular annual assessment of the scientific results of BAS as a public research organisation with the greatest potential for development by the Parliament is implemented in 2012, after international evaluation in 2009.</p> <p>The university rating system (2010) serves as an effective tool for discretionary state funding according to universities' achievements, including research activities (up to 25% more financing than the allocated subsidy can be received). No any consolidations of R&I in universities took place.</p> <p>The new Law on the Development of the Academic Staff (2010) abolished the Supreme Attestation Commission. This decentralised the academic, as well as research career promotion and lead to increased autonomy of the universities to grant academic titles. In some cases however this put barriers to the mobility of the academic staff between universities. There is need of elaboration of common criteria and rules for granting academic titles so that they can be recognised by all institutions.</p>
Improve business R&D output via collaboration with PRO, HEI & NGO and avoiding bottlenecks for start-up companies and innovative SMEs	<p>NSF 2010 competition-based scheme</p> <p>"Stimulating scientific research in the state universities"</p> <p>OP Competitiveness.</p> <p>Launch of JEREMIE and JESSICA funds (2010).</p> <p>Adopted National Reform Programme of the Republic of Bulgaria 2011-2015.</p> <p>New call of the National Innovation fund, October, 2012 for R&D projects with a total budget of 2.55 m. euro</p>	<p>Only the National Science Fund (NSF) allows for the communication between the industry, educational institutions, and public research centres. There is need on new support measures in this area.</p> <p>Focus in OP Competitiveness is strongly placed on the infrastructure and much less on the services, which might result in under-use of the available funds. Despite the successful launch of JEREMIE and JESSICA funds, there is still need of more venture capital. Bulgaria is about to lose its competitive advantages due to the decreased quality of education and brain-drain. The Bulgarian economy continues to have a low technology profile. The funding to intermediary organisations for technology transfer is still neglected. The lack of long-term budget financing plans for specific research priorities results in insecurity in the private sector and its investment decisions. The National Reform Programme of the Republic of Bulgaria 2011-2015 promotes the clusters, technology transfer offices and technology parks, however its effects are yet to be seen.</p>

4 NATIONAL PROGRESS IN INNOVATION UNION KEY POLICY ACTIONS

4.1 Strengthening the knowledge base and reducing fragmentation

Promoting excellence in education and skills development is an important element of the national policy, but still needs better integration of macroeconomic, education and skills and S&T&I policies.

The knowledge base in the country has been negatively affected by the brain drain and insufficient foreign and internal market demand for domestic high-tech products, accompanying transformation processes during the last two decades. It could be characterized as comparatively weak when compared to most of the other European countries. The recent EU funding has had a positive, but still insufficient, impact on the national knowledge base. Measured as R&D employment in high- and medium-high-technology manufacturing sectors as share of total employment it is slowly increasing since 2010 and becoming 3.6. This is still far below EU 27 (5.6). A good sign is the tendency of increasing employment in knowledge intensive service sector as a share of the total employment from 27.1% in 2009 to 29.1% in 2012, while in EU27 it is 38.9%.(Eurostat).

The number of researchers has decreased more than six times during the transition period. In 2012 the number of researchers (FTE) in relation to the labour force was 0.5% (Eurostat). This is almost 4 times less than EU-28 (1.9%). Labour market - demand-supply of researchers, needs further efforts to become balanced as outward flow is dominated the inward one.

The level of educated people in the country is insufficient. According to IUS 2013 new doctorate graduates (ISCED 6) per 1000 population aged 25-34 are 0.5, which is 3 times below EU27. The percentage of the population aged 25-64 having completed tertiary education is 27.3, which is below EU27 (34.6). The international scientific co-publications per million population is 205, which is two third of the EU 27. Scientific publications among the top 10% most cited publications worldwide in 2012 as % of total scientific publications of the country is 2,62, which is less than performed in IUS 2011 (3.59). It is far below EU27- 10.9.

As regard to research careers and recruitment; the Law on the Development of Academic Staff (2010) grants universities autonomy in defining policies for their staff. There are not enough common promotion procedures for researchers that could ensure career stability. In this respect recent debates, published on the web of the MES suggest to return to the common procedures and criteria. Salaries at public research institutions are low, fixed or depend on the academic title and the provided budget subsidy. The situation is similar in the universities, although with the new rating system they can slightly increase their public funding through academic and research achievements. The open research positions are publicly announced. Job vacancies are published

on university websites (however mostly in Bulgarian), as well as on the EURAXESS jobs portal. In addition, job vacancies are published on other platforms (e.g. the labour agency). It is not a statutory requirement to advertise job vacancies on the EURAXESS jobs portal. As a general rule, national grants and fellowships are not open to non-residents. In 2012, 46 % of university-based researchers were satisfied with the extent to which research job vacancies are publicly advertised and made known by their institution (MORE2 Survey, 2012). As a tool to improve the knowledge base in the country the Operational programme 'Human resource development' (OP HRD) supports the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training. In addition to (new) policies aimed at improving the research profession in Bulgaria, bilateral programmes such as the 'Sciex' Programme with Switzerland, are considered not only as measures for importing researchers' funding opportunities, but also as instruments for increasing the quality of doctoral training in Bulgaria.

The recruitment of researchers in the most research centres follows the best European practices. In 2007, the Bulgarian Rectors' Conference, as a collective body of the largest national university network, has signed the European Charter for Researchers and Code of Conduct for the recruitment of researchers. One researcher organisation has received the 'HR Excellence in Research' logo for its progress in implementing the Charter and Code.

The education curricula should also be improved to focus on creativity and critical thinking, and it should be based on analysis of the labour market. Although the state budget foresees some increase of the subsidy for the universities, the financial support in general has remained too weak to bring about a qualitative change in the universities' research activities. From the other side the big number of universities for a country like Bulgaria is an additional barrier to improving universities' research activities. In this respect the question why to keep a reduced budget subsidy for the BAS, where human and technical potential are still concentrated and effective, is still open.

Research Infrastructures

The National Roadmap for Research Infrastructure was adopted in 2010 and now the country is included in several European research infrastructure projects. Still, Bulgaria lacks financial, industrial and human potential for the construction and maintenance of big research infrastructures. The research base remains obsolete. There also is need of further regulations and incentives in regard to the cross-border cooperation, jointly funded activities, as well as common foresight. The main national measures supporting cross-border cooperation include the bi-lateral scientific and education agreements with other countries. More national collaborative support schemes are needed to raise the joint research activities, as well as the number of co-publications and co-patenting.

The weak links between R&D institutions and industry remain a major challenge. One of barriers to better links between them is the lack of strong institutional policies in the field of intellectual property in the country. Another problem concerns sustainability of the established technology transfer offices.

The EU resources provide good opportunity for improving research infrastructure but it is not sufficiently used. As participant in the FP7, among the EU-27, Bulgaria ranks 20th in terms of number of applicants and requested EC contribution (Innovation Union Competitiveness report 2011 for Bulgaria). Despite Bulgaria's participation in the FP7, ESF, COST, ERA NET+ and other EU-programmes, there is no real concentration of public resources in priority scientific areas, which could contribute to increasing competitiveness of the research infrastructures.

The quality of the research is becoming important task of its monitoring in the country. According to the National reform program 2012 draft regulations for monitoring and evaluation of scientific research activities carried out at the higher education institutions and scientific organisations in compliance with the provisions of the Law on Promotion of Scientific Research in 2011, introducing the principle of international peer review, has been elaborated. The draft is in process of approval. The introduction by MEYS as of 2013 of the system of regular internal and international evaluation of scientific activity will contribute to raising the efficiency of scientific activities, but will also make it possible to introduce a differentiated approach in defining the state subsidy for higher education institutions and scientific organisations.

There are priority areas for development of scientific infrastructure in the country. They were defined in the National Roadmap for Scientific Infrastructure, which covers large research complexes, servicing specific economic and social needs of the country, the region of south-eastern Europe and the pan-European infrastructures in which Bulgaria will participate. Such are the energy, maritime explorations, and new materials for various applications, ICT and social research.

4.2 Getting good ideas to market

Improving access to finance

To improving SMEs access to financing, the innovative potential of SMEs is fostered by the development of pro-innovative infrastructure and business incubators and direct support for the commercialisation of innovative products under OPDCBE (NRP).

In the overall ranking of the 2011 Global Innovation Index of EIBA, the country ranks in the first third of the ranking list of countries with pronounced strengths in terms of detailed credit information.

Protect and enhance the value of intellectual property and boosting creativity

The country performs clear weaknesses in terms of protect and enhance the value of intellectual property, including patent applications. In the overall ranking of the 2011 Global Innovation Index of EIBA, it ranks in the first third of the ranking list of countries with pronounced strengths in terms use of trademarks. In 2011, Bulgaria had 43 USPTO patents issued per million of inhabitants and 1.1 EPO patents per million of inhabitants, compared to 100 and 4.6, respectively, for Hungary ("moderate innovator"), and 951 and 109 for Finland (one of the top 4 innovation leaders in the EU) (NRP 2013).

Public procurement

The New OP “Competitiveness and innovation” and OP “Scientific research for smart growth” projects (as of the end of 2013) introduce national targets on public procurement of innovative goods and services. They suggest public tenders are launched that include innovation criteria; public tenders launched for joint public procurement of innovation, which updates national procurement policy with a specific objective of supporting innovation.

4.3 Working in partnership to address societal challenges

Bulgaria is included in several initiatives of the European innovative partnership (EIP). Most of them address one of the societal challenges which is of significant importance for the country, namely the ageing population. Among them are: Patient medication adherence programs; European Union Virtual Ageing Research Data Base; Ambient Assisted Living for All; AgeingWell - Network for the Market uptake of ICT for Ageing Well; Self-care support in pharmacy / AESGP - Association of the European Self-Medication Industry; From cradle to ageing well perspectives in chronic diseases&telemedicine; EHTEL support to Capacity Building towards Seamless Integration for Personal Health Services by 2020 / EHTEL; Societal Impact of Pain / European Federation of IASP Chapters (EFIC); Improving nutrition in the elderly / AESGP - Association of the European Self-Medication Industry; Active and Healthy - The role of the physical therapist in physical activity / European Region of the World Confederation for Physical Therapy; Older Immigrants and Active and Healthy Ageing / Julius Center for Health Sciences and Primary Care, etc.

The benefits have been different:

1) The EU funded MATURE@eu project supported employers to be age-diverse in their recruitment practices, and involved organisations from Austria, Bulgaria, Germany, Greece, Hungary, the Netherlands, Slovenia, Switzerland and the UK, interested in changing the preconception that older workers are less valuable than younger ones. To this end, an evidence base was compiled so as to support private sector leaders, age representatives and policymakers in mainstreaming an age friendly environment into recruitment practices and policies.(More information is available at: <http://www.mature-project.eu/>).In 2012 the EC adopted the European Innovation Partnership (EIP) for water. Bulgaria also established a National Innovation Fund for financing innovative projects on competitive basis. (see: www.bwa-bg.com);

2) An increasing number of older people are immigrating to Bulgaria from other EU member states, in particular the UK, Ireland and the Netherlands, attracted by good weather and favourable prices. The MOBIAGE project, which is funded by DG Employment, Social Affairs and Equal Opportunities (2007-2010) involved five partners from Bulgaria, Romania, Denmark, Italy and Hungary, aiming to promote the integration and well-being of these immigrants through a wide range of activities. These included: investigating the perceived needs of immigrants; providing practical support to municipalities by facilitating dialogue between the local administration and immigrant communities; language courses for immigrants (both traditional and online); development of an information portal via the Bulgarian administration

society, and various other social activities. The project won third prize in the AAMEE good practice project competition.

European Innovation Partnership on Smart Cities and Communities, Renovation and nZEBs Strategies, Smart Grids and Mob were presented on the Forum & Exhibition for South-East Europe on 5-7 March 2014 in Sofia. The event enhanced the key role of the innovative technologies which could provide a long-term sustainable development of the Region as well as encourage the foreign investments in local economics through new projects, policies and practices. It gathered prominent local and international suppliers and buyers and also industry professionals from both private and public sector.

The event format included the following initiatives: 'Save the Planet' (waste management & recycling), 'Energy Efficiency & Renewables', 'Smart Cities' (intelligent buildings, energy storage, mobility & ICT) and LiftBalkans (elevators). Leading companies from Austria, Bulgaria, China, Czech Republic, Denmark, Germany, Italy, Poland, Romania, Slovenia, Sweden, Switzerland and the Netherlands showcased their latest products and innovations. This year the accent was put on the energy-efficient products, hydro- and bioenergy and biomass. The demand for separating, baling, recycling and composting has been increased and many international companies could enter the regional market.

Taking into consideration the growing energy and resource consumption, the necessity of ICT application, participatory approach for energy production, distribution and use come to the fore. Intelligent solutions for energy storage, building automation, mobility, telemetry and telematics attracted the visitor interest. EREMA, IFE Aufbereitungstechnik, Untha Shredding Technology, Vecoplan, Herbold Meckesheim, Tecnova, Apricus Solar, Global Hydro Energy, CPM Europe and Leader Light are among the exhibitors. New generation high-efficiency heat pumps will be presented by Omnia Contractors and Termopompeni Sistemi. Hitachi Zosen Inova, Ebios Energy and Weiss demonstrated their competence, broad know-how and international experience in the waste-to-energy industry.

So far EIP on active and healthy ageing has made no investments in Bulgaria. The EIP may invest up to 40% of the Fund in Bulgaria. (<https://webgate.ec.europa.eu/eipaha/initiative>).

4.4 Maximising social and territorial cohesion

The **draft of Innovation Strategy for smart specialisation (see 2.7.)** is not explicitly directed to maximize territorial cohesion. Some measures to maximise the territorial cohesion are included in the draft of OP "Regions in growth". A better coordination between this OP and OP "Science and Education for Smart Growth 2014-2020" and "Competitiveness and Innovation" is needed.

4.5 International Scientific Cooperation

International cooperation in the fields of science and technology is based on bilateral and multilateral international agreements and implementation of cooperative programmes. A number

of countries and international partners with which the Bulgarian government and the MEYS have signed inter-state legal acts, cooperation is achieved solely on the basis of direct inter-institutional agreements.

The bilateral scientific collaboration agreements are implemented through the calls of the National Science Fund. The calls often list several eligible areas of research and can be characterised as either wide-ranging or generic in topic. The Bulgarian Academy of Sciences has concluded scientific bilateral agreements with EU-countries and countries outside Europe.

The research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes, however these are primarily project-based and institutional support is insufficient.

For internationalization of S&T cooperation an ordinance in accordance with the European Council Directive 2005/71/EC of 12 October 2005 (Наредба във връзка с Директива на ЕС 2005/71/EC от 12 Октомври 2005) has contributed. It concerns a specific procedure for admitting third country nationals for the purposes of scientific research includes a provision on the obligation for HEI and BAS to apply policies to remove barriers which hamper cross-border access to and portability of national grants.

Bulgaria takes part in the European Framework Programmes for research, technology development and demonstration activities. For the period 2007-2012, BGN 158.4 million was absorbed. Bulgaria is well positioned in some of the other on-going initiatives of the European Research Area – the European Cooperation in Science and Technology programme (COST), the schemes under Joint Research Centres, and the schemes for coordination of national research programmes. As of the end of 2012, Bulgaria has taken part in 140 actions and 251 projects under the COST initiative, it has signed cooperation agreements with 14 countries, and agreements with another 3 countries will be signed. Under the Seventh Framework Programme, 580 contracts were signed at a total value of BGN 158.4 million. Bulgaria's success rate is 16.6%, compared to a EU27 average of 21.8%. Financing has been provided to 130 bilateral cooperation projects for the period 2007-2012. Preparations are underway of the document package for the "Horizon 2020" framework programme, and the first information events have already been held. (NRP2013)

5 NATIONAL PROGRESS TOWARDS REALISATION OF ERA

5.1 More effective national research systems

ERA priority 1: More effective national research systems concerns competitive funding through calls for proposals and institutional assessment. This is a part of the National Strategy for Scientific Research to 2020 (2011) which requires an increase of the competitive public funding for R&D projects. In this respect the National Fund Scientific Research offers competitive grants for fundamental and applied research in priority areas 2012 with a total budget of BGN 21 000 000 (€10.77 million), and preliminary budget for 2012: BGN 14 800 000 (€7.6 million). On the third place in October 2012, the National Innovation Fund (managed by the Executive Agency for Small and Medium-Sized Enterprises) opened a new call for R&D projects with a total budget of BGN 5 million (€2.55 million). OP Competitiveness, acting since 2007, continues to increase its contracting rate for the support of innovation and technology projects.

According to the Law on Scientific research promotion, in force since 2003, the allocation of funding is following international peer review standards. This requirement is introduced also by the Bulgarian academy of sciences. The Law on Higher Education has been in force since 1995. It requires the allocation of funding to follow international peer review standards. This requirement is introduced by the Bulgarian academy of sciences.

Bulgaria has made some progress with respect to the second action under the first priority as well. According to the National reform program 2012 draft regulations for monitoring and evaluation of scientific research activities carried out by the higher education institutions and scientific organisations, introducing the principle of international peer review, have been elaborated. The draft is in process of approval. The introduction by MEYS as of 2013 of the system of regular internal and international evaluation of scientific activity will contribute to raising the efficiency of scientific activities, but will also make it possible to introduce a differentiated approach in defining the state subsidy for higher education institutions and scientific organisations. A good example is the joint ESF and ALLEA International evaluation “Research at the Bulgarian academy of sciences” in 2009 which has applied the best practices in international peer review. The evaluation has led to the re-structuring and re-focusing of BAS research taking place up to now.

5.2 Optimal transnational co-operation and competition

The country is part of 23 transnational collaboration networks, working in 8 programmes with 15 organizations. 130 bilateral cooperation projects are in progress.

Bulgaria takes part in the European Framework Programmes for research, technology development and demonstration activities. For the period 2007-2012, BGN 158.4 million was absorbed. Bulgaria is well positioned in some of the other on-going initiatives of the European Research Area – the European Cooperation in Science and Technology programme (COST), the schemes under Joint Research Centres, and the schemes for coordination of national research programmes. As of the end of 2012, Bulgaria has taken part in 140 actions and 251 projects under the COST initiative, it has signed cooperation agreements with 14 countries, and agreements with another 3 countries will be signed. Under the Seventh Framework Programme, 580 contracts were signed at a total value of BGN 158.4 million. Bulgaria's success rate is 16.6%, compared to a EU27 average of 21.8%. Financing has been provided to 130 bilateral cooperation projects for the period 2007-2012.

Regarding **ERA priority 2: Optimal transnational co-operation and competition for implementing joint research agendas addressing grand challenges**, the ERAWATCH Country reports Bulgaria (2012) states that the ERA-research policies are formally integrated in the national research policy documents and strategies. The research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes, however these are primarily project-based and institutional support is insufficient. ERAWATCH Country reports Bulgaria (2012) also observes that there is:

- Need of strategic guidelines for participation in European coordination and integration of research funding
- Need of further regulations and incentives with regard to the cross-border cooperation, jointly funded activities, as well as common foresight.

There is a need for more effective mechanisms to support the preparation of European projects under the EU Framework Programmes. Re-institutionalising of the Bulgarian Council on Innovation and its advisory functions on issues such as international cooperation, envisaged in the draft Law on Innovation.

Adopted in 2010, the National Research Strategy aims to:

- Formulate a national science policy which puts in place conditions and defines prospects for attaining the Europe 2020 targets;
- Initiate and promote a process of modernisation of current R&D structures as a necessary condition for increasing public funds for science;
- Contribute to the transformation of Bulgarian society into a knowledge society.

The strategy states that it is important to have an active stance on the new European initiatives, such as implementation of joint programming initiatives between the individual Member States. It also recognizes that the gradual expansion of the partner countries on European and global scale is important for the building of large interdisciplinary research networks and consortia.

The Researchers Report (EU, 2012-1) reports that non-competitive salaries, archaic research infrastructures, administrative burden, a low level of R&D funding as well as a low level of funding from industry are the main obstacles to researchers' mobility in Bulgaria.

No further relevant information was found and as a conclusion there is no cross-border interoperability of national programmes. (Analysis of the ERA state-of-play in Member States and Associated Countries: focus on priority areas).

The priority areas for development of scientific *infrastructures* were defined in the National Roadmap for Scientific Infrastructure, which covers large research complexes, servicing specific economic and social needs of the country, the region of south-eastern Europe and the pan-European infrastructures in which Bulgaria will participate. Such are the energy, maritime explorations, new materials for various applications, ICT and social research.

The National Roadmap for Research Infrastructure, adopted in 2010, has allowed Bulgaria to be included in several European research infrastructure projects.

Still, Bulgaria lacks financial, industrial and human potential for construction and maintenance of big research infrastructures.

5.3 An open labour market for researchers

Bulgaria has made some progress in contributing to the **ERA priority 3: An open labour market for researchers**.

Regarding Cross-border access to and portability of national grants an ordinance in accordance with the European Council Directive 2005/71/EC of 12 October 2005 on a specific procedure for admitting third country nationals for the purposes of scientific research includes a provision on the obligation for HEI and BAS to apply policies to remove barriers which hamper cross-border access to and portability of national grants.

A survey 2012-2013 shows 82,9% of teaching staff of state universities would like to leave because of the low salaries, 55% of them refer the recruitment system. The results are similar to those of 2007-2008 survey (M.Matev, I., Zareva, A.Kirova, 2014, mimeo).

The Bulgarian Rectors' Conference (as a collective body of the largest national university network) has signed the European Charter for Researchers and Code of Conduct on 2008. The European Charter for Researchers is a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers as well as of employers and/or funders of researchers. Still, there are no specific regulations or schemes for increasing the researchers' salaries. The Code of Conduct for the recruitment of researchers consists of a set of general principles and requirements that should be followed by employers and/or funders when appointing or recruiting researchers. These principles and requirements should ensure observance of values such as transparency of the recruitment process and equal treatment of all applicants, in particular with regard to the development of an attractive, open and sustainable European labour market for researchers, and are complementary to those outlined in the European Charter for Researchers. Institutions and employers adhering to the Code of Conduct will openly demonstrate their commitment to act in a responsible and respectable way and to

provide fair framework conditions to researchers, with a clear intention to contribute to the advancement of the European Research Area.

Some recent developments are following the principles for innovative doctoral training, as for example (EU 2012-1):

- Career prospects of PhD students (e.g. mentoring, alumni networks, participation at job events)
- Schemes and support actions fostering interdisciplinary research (e.g. shared supervision of the work of the doctoral candidate, networks representing several scientific disciplines)
- Schemes or activities to expose PhD students to industry/other relevant employment sectors (e.g. placement, private-funding, involvement of non-academics...)
- Schemes and support actions for international networking (e.g. collaborative research, joint degrees, participation in international conferences, short/long research visits, secondments, etc.)
- Schemes and support actions for the provision of transferable skills training (e.g. training on communication, teamwork, entrepreneurship, project management, intellectual property rights, etc.)

[National Strategy of Scientific Research to 2020](#) defines the special attention that will be paid to attracting and keeping young and talented people in science. The existing programmes will continue to be operated, and they Programme operation will continue, and they will be further developed, under which young scientists may receive support following the project principle – introduction of “project-based” doctoral studies, post-doctoral programmes, funding of young people’s participation at international conferences, provision of funds for publication in reference magazine, etc. of A national interactive platform will be maintained for linking education, science and business.

[National Strategy of Scientific Research to 2020](#) states also that Joint degree programmes with leading European universities has been introduced, finishing with issuance of a separated diploma by both universities. It also announces that special attention will be paid to attracting and keeping young and talented people in science. According to the strategy, programme operation will continue, and they will be further developed, under which young scientists may receive support following the project principle – introduction of “project-based” doctoral studies, post-doctoral programmes, funding of young people’s participation at international conferences, provision of funds for publication in reference magazine, etc.; Faculty, students and doctoral students exchange and cooperation with other HE institutions is supported and expanded to promote teaching, research, expert, and creative activities to expand the educational profile of doctoral students through joint projects with international universities.

The Bulgarian Government has not put in place a dedicated ‘Skills Agenda’ aimed at improving researchers’ employment skills and competencies. However, the improvement of researchers’ skills and competencies is addressed in different laws and regulations and forms part of national and international research projects. In 2006 the Ministry of Economy and Energy (currently Ministry of Economy, Energy and Tourism) launched an initiative for the creation of entrepreneurship centres in the universities in order to encourage entrepreneurship skills in students and the creation of new technology firms. According to Measure 10 of the National Innovation Strategy, centres for the promotion of entrepreneurship activity of university students have been set up in four universities.

What concerns the dedicated quality assurance system for doctoral training on institutional level, [the National Evaluation and Accreditation Agency](#) states that the universities that can offer doctoral programmes should be carefully selected. According to the Higher Education Act, only doctoral programs rated with the maximal grade “very good” are accredited. The accreditation of a doctoral program by the agency is realized at two levels – as an integral part of the institutional accreditation of the higher education institutions necessary for completeness of the evaluation of their teaching and research potential and by means of a subject evaluation of each scientific specialty listed in the National Classifier. Instruments used by the Agency are as follow:

- Carrying out impact assessment in application of new solutions and measures in the field of science and innovation;
- Introduction of compulsory, regular international evaluation of the organisations providing financing to and carrying out scientific research, R&D and innovation;
- Regulation of long-term objective evaluation and monitoring criteria of scientific programmes and results;
- Definition of a system for regular internal evaluation of scientific organisations with clear long-term criteria.

Bulgaria is supporting coordinated personalised information and services to researchers through ERA initiative EURAXESS - European network for mobility of researchers. EURAXESS BULGARIA portal contains practical information concerning professional and daily life, as well as information on job and funding opportunities. The services centres help researchers and their family to plan and organise their move to a foreign country, providing assistance in all matters related to mobility, see our services commitment. There are no any measures at National level that forces the participation to EURAXESS.

The ERA-research policies are formally integrated in the national research policy documents and strategies. The research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes, these are primarily project-based and institutional support is insufficient. The Researchers Report (EU, 2012) reports that non-competitive salaries, archaic research infrastructures, administrative burden, a low level of R&D funding (0.55% of GDP in 2010) as well as a low level of funding from industry are the main obstacles to researchers’ mobility in Bulgaria.

The National reform programme reports in 2013, along with the development of Sofia Techno park, a plan for an entrepreneurship training for young talents, scientists and R&D units with ideas with high innovative potential. Operational programme “Human Resources Development” (OP HRD) fosters the interest of young people who are completing their doctoral studies, and hence improve the age profile of people, engaged in R&D, as from 2012, funding has been made available for one month internships of doctoral candidates in high-tech R&D centers and infrastructure. The operational programme “Human resource development”(OP HRD) supports the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training providing funds for mentoring, research training, etc.

5.4 Gender equality and gender mainstreaming in research

Regarding the ERA priority 4 - Recruitment, retention and carrier progression of female researchers, the Bulgarian strategic documents are harmonised with the European requirements, including in the area of equal treatment of women and men in research. This harmonisation of strategic documents is according to Council Directive 2000/78/EC, 20001127 of 27 November 2000. Bulgaria has not adopted specific gender equality legislation.

5.5 Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

Bulgaria’s contribution to ERA priority 5 concerns policies on access to and preservation of scientific information. National reform programme 2012-2014 includes support to open access through infrastructure support for building and maintaining high-performing computing infrastructure, and access to different network infrastructures like GRID networks, European digital data bases. To be adopted in 2014. ERA initiative open access infrastructure for research in Europe (OPEN AIRE) of 2010 includes setting up of data repository of Open Access to research outputs, journal articles, conference papers and datasets of various kinds, also setting up links of the national repositories to European repositories.

The digitalization of valuable materials from the St. Cyril and Methodius National Library collections started in 2006. In autumn 2007 these digital images became accessible for users through the library’s website. Over 290 000 files have been digitalized till the end of 2012 – manuscripts, old printed books, unpublished documents from the Bulgarian Historical Archive and Oriental Department, portraits and photos, graphical and cartographical editions, Bulgarian newspapers and journals from 1844 to 1944 – images and their systematical descriptions. Users could search in the Electronic archive through the specialized system DocuWare. The digitalized originals are on free access for users.

Central library of the BAS provides free on-line access to on-line resources. The resources are accessible via BAS IP addresses. There are different data bases of on line resources <http://cl.bas.bg/information-services/on-line>. The world’s largest bibliographic database, providing the foundation of cooperative library services in metadata management, discovery,

resource sharing and collection management (OCLC WorldCat®) . Support work together to improve access to the information held in libraries around the globe; reduction of the costs for libraries through collaboration.

Open innovation and knowledge transfer between public and private sectors through national knowledge transfer strategies is taking place with the latest version of the draft for a Law on Innovations which proposes a new modern organization of innovation processes and eliminates the existing imbalances in the methods of financing research and innovation in enterprises. According to the NRP2012 since 2011 the “Science + Business” project assists the participants in the science-innovative system in maintaining sound and flexible dialogue on issues and problems of common interest with view to overcome imperfect information and the lack of adequate environment, including a digital one.

Open innovation and knowledge transfer between public and private sectors takes place with technology Transfer Offices. According to the NRP 2012 a Grant procedure (as defined in NRP 2011–2015) to establishing New and Strengthening the Existing Technology Transfer Offices has started in the amount of EUR 5 million.

Annex 1. PERFORMANCE OF THE NATIONAL AND REGIONAL RESEARCH AND INNOVATION SYSTEM

Feature	Assessment	Latest developments
1. Importance of the research and innovation policy	<p>(-) Policy governance had been complex and fragmented, with a consequent lack of coordination in policy design and implementation</p> <p>(+) Specific programmes are designed and devoted to grand challenges in the draft projects of OP “Scientific research for smart growth” and OP “Competitiveness and innovation”.</p>	<p>Increased state 2014 subsidy for the BAS to the level of 2009.</p> <p>The draft projects of OP “Scientific research for smart growth” and OP “Competitiveness and innovation” are published for public discussion (in Bulgarian only).</p>
2. Design and implementation of research and innovation policies	<p>(-) There is no clear a multi-annual STI framework in place providing a long-term policy context to prioritise expenditure on STI.</p> <p>(-) there is not any effective and stable centre-of-government structure, defining broad policy orientations on a multi-annual basis and ensures sustained and properly coordinated implementation</p>	<p>There are some suggestions for establishing a structure backed up by networks involving all relevant stakeholders, such as industry, regional and local authorities, parliaments and citizens (from RO, Chamber of commerce and industry, etc.)</p> <p>The draft projects of OP “Scientific research for smart growth” and OP “Competitiveness and innovation” suggest limited number of priorities, preceded by an international analysis of strengths and weaknesses at national and regional level and of emerging opportunities (‘smart specialisation’) and market developments.</p>
3. Innovation policy	The concept of innovation is actively promoted, but the supply and demand-side policies are not developed in enough a consistent manner .	Innovation strategy for smart strategy is published for public discussion
4. Intensity and predictability of the public investment in research and innovation	The public investments in education, research and innovation are not prioritised and budgeted in the framework of multi-annual plans to ensure predictability and long term impact, and drawing on the Structural Funds where appropriate.	<p>There are some attempts to prioritise the public funding go high schools.</p> <p>Innovative financing solutions (e.g. public-private partnerships) and the use of tax incentives are under discussion</p>
5. Excellence as a key criterion for research and education policy	<p>– Public research funding is increasingly allocated on a competitive basis. The balance between institutional and project-based funding of research has not enough clear rationale. Institutes are evaluated irregularly on the basis of internationally recognized. Results of publicly funded research are still not enough protected and published in a way that encourages their exploitation.</p> <p>– the lack of funding resources is a barrier higher education and research institutes largely to enjoy the necessary autonomy to organise their activities in the areas of education, research, and innovation. It seems they are not attractive enough to draw on alternative sources of funding such as philanthropy. There are conditions to apply open recruitment methods</p> <p>– The financial and social frameworks for</p>	<p>- 7 centres of excellence are working</p> <p>- The projects of OP “Scientific research for smart growth” and OP “Competitiveness and innovation” and OP “HRD” take the problem in consideration</p>

	research careers, including doctoral studies, do not offer sufficiently attractive conditions to both men and women in comparison to international standards, especially those in the US. This is the reason US to attract the most of the researchers.	
6. Education and training systems	<p>– Policies and incentives are not in place to ensure a sufficient supply of (post)graduates in science, technology, engineering and mathematics. There is not an appropriate enough mix of skills among the population (including through strong vocational and education and training systems) in the medium-to-longer term.</p> <p>– Education and training curricula is not focused enough on equipping people with the capacity to learn and to develop transversal competences such as critical thinking, problem solving, creativity, teamwork, and intercultural and communication skills.</p> <p>Special attention is paid to address innovation skills gaps. Entrepreneurship education and training is widely available or included in curricula. Partnerships between formal education and other sectors are actively promoted to that end.</p>	The MEYS has taken some attempts to increase sufficient supply of (post)graduates in science, technology, engineering and mathematics
7. Partnerships between higher education institutes, research centres and businesses, at regional, national and international level	<p>Where possible, research efforts are accompanied by instruments to support the commercialisation of innovative ideas. Policies and instruments such as innovation/knowledge clusters, knowledge transfer platforms, and voucher systems, are in place to encourage co-operation and knowledge sharing and at creating a more favourable business environment for SMEs.</p> <p>– Researchers and innovators are able to move between public and private institutes. There are not clear enough rules on the ownership of intellectual property rights. Sharing and support systems are insufficient to facilitate knowledge transfer and the creation of university spin-offs and to attract (venture) capital and business angels.</p> <p>– The lack of strategy and funding are obstacles to setting up and operating transnational partnerships and collaborations</p>	In progress
8. Framework conditions promote business investment in R&D, entrepreneurship and innovation	<p>– Policies to promote innovation, entrepreneurship and enhance the quality of the business environment are closely interconnected.</p> <p>– the favourable conditions have to be further developed to foster a growing and robust venture capital market, especially for early stage investments.</p> <p>– Consistent with the Small Business Act for Europe (COM (2008)374), the rules for starting up and running a business are simple and designed from an SME perspective in a draft Strategy for SMEs.. The legal framework is transparent and up-to-date. Rules are properly enforced. Markets are dynamic and</p>	In progress

	<p>competitive. Willingness to take risks is promoted. Insolvency regulations support the financial re-organisation of enterprises. There is no discrimination against entrepreneurs who may have failed the first time around.</p> <ul style="list-style-type: none"> – An efficient, affordable and effective system for the protection of intellectual property has to be developed in order to foster innovation and preserve investment incentives. The market for innovative products and services has to be kept constantly up to date by means of an efficient standard-setting system. 	
<p>9. Public support to research and innovation in businesses is simple, easy to access, and high quality</p>	<ul style="list-style-type: none"> – There is a limited number of well-targeted, clearly differentiated, and easy to access support schemes consistent with support available at EU level and that address well identified market failures in the provision of private funding for innovation. – Funding support is tailored in some extent to the needs of companies, particularly SMEs. The emphasis has to be placed on outputs rather than on inputs and controls. There are some measures the bureaucracy to be kept to a minimum, selection criteria are straightforward and time to contract and to payment are as short as possible. Funding schemes are evaluated and benchmarked against comparable schemes in other countries. – National funding is still not fully allocated through international evaluation procedures and encourages trans-national cooperation. Rules, procedures and time-tables are aimed to be aligned in order to facilitate participation in EU programmes and co-operation with other Member States. – Specific support is available to young innovative companies to help them commercialise ideas rapidly and promote internationalisation. 	In progress
<p>10. The public sector itself is a driver of innovation</p>	<ul style="list-style-type: none"> – The public sector provides not enough incentives to stimulate innovation within its organisations and in the delivery of public services. – Some use is made of public procurement of innovative solutions in order to improve public services, including through dedicated budgets. Tenders are based on output-based performance specifications and contracts are awarded on the basis of qualitative criteria which favour innovative solutions such as life-cycle analysis, rather than lowest price only. Opportunities for joint procurement are in progress. – Where possible, government-owned data is made freely available as a resource for innovation. 	In progress

Annex 2. NATIONAL PROGRESS ON INNOVATION UNION COMMITMENTS

		Main changes	Brief assessment of progress / achievements
1	Member State Strategies for Researchers' Training and Employment Conditions	Planned implementation of the new "Law on the Development of Academic Staff", which enables universities to define their own staff policy. In addition, it provides a mechanism for regulating the careers of scientific personnel. The implementation of the new Law will result in a qualification and career development system for academic staff (planned for 2014).	Bulgarian Rectors' Conference has signed the Charter and Code. EURAXESS Bulgaria provides up-to-date information and personalized assistance to mobile researchers and highly qualified specialists. The portal contains all necessary information for a researcher moving to Bulgaria – it explains the entry and visa conditions, taxes and social security and daily life in Bulgaria. It also provides information on job offers from universities and other institutions as well as scholarships and grants for research to support researchers in search of funding opportunities. Job vacancies are published on university websites (however mostly in Bulgarian), as well as on the EURAXESS jobs portal. In addition, job vacancies are published on other platforms (e.g. the labour agency). It is not a statutory requirement, however, to advertise job vacancies on the EURAXESS jobs portal.
4	ERA Framework		These are covered by the ERA Communication fiche – last revised in July 2013 and to be updated as a separate deliverable by 31.01.2014
5	Priority European Research Infrastructures	Published invitation for updating the existing National roadmap 3 No information for Launching or new financial commitments to the construction and operation of the ESFRI Roadmap, and to other global, national RI of pan-European interest.	National Roadmap for Research Infrastructure http://www.mon.bg/top_menu/science/infrastructure/ . Decision of the Government № 692 of 21.09.2010. The Roadmap has identified priority infrastructure as well as possible sources of funding. In developing the National Roadmap attracted experts from the European Strategy Forum for research infrastructures and is made ex ante assessment included in it infrastructure. As of 2013 MES is participating in 3 Pan-European research infrastructures (signed MoU) – EURO_AGRO; BBMRI; CLARIN-e 2. Generally, provisions allowing third-country researchers to work in Bulgaria do exist (such as the Foreign Nationals Act) but do not resulting in (leading) national and third-country researchers being attracted to Bulgaria. As a general rule, national grants and fellowships are not open to non-residents.
7	SME Involvement	A draft of a national strategy to promote SMEs 2014-2020. It is fully adapted to the SBA. The evaluation criteria for the implementation of the strategy objectives meet the criteria used by the Commission in assessing the implementation of SBA in the so called Fact Sheets	The draft National Strategy for Promotion of Small and Medium Enterprises 2014-2020 was sent for inter-ministerial consultation on 23 October 2013, having previously held a public discussion. Comments and feedback from both discussions are reflected in the relevant coordination tables.

11	Venture Capital Funds	<p>1) Number of applications for EU Venture Capital funds passports- n/a</p> <p>2) Introduction of favourable taxation regimes - Decision № 484/15.08.2013 of the Government package of measures to reduce the regulatory burden has drafted amendments to the Law on the Commercial Register, which provides for a reduction of the period of initial registration of traders from 3 days to one day</p> <p>Information about the proposal and the specific sizes available on the website of the Ministry of Justice: http://www.justice.government.bg/15/</p> <p>3) JEREMIE is a programme used to create the seed and start-up funds and accelerators that fills a niche in the market to fund business ideas and start-ups. Banks do not conduct such funding. Funds run a little over a year and are considered one of the most successful not only in Bulgaria but also in the wider Balkan region. As a result, Bulgaria climbs 12 places in the "Entrepreneurship" by SBA and now occupies ninth place. As occupies sixth place in the EU in the ranking of the World Bank density of start-ups. Funds are managed by private companies, using funds JEREMIE, awarded through the program "Competitiveness" MEE, with funds coming through the EIF. http://doingbusiness.org/data/exploretopics/entrepreneurship http://eleven.bg/bulgarian/ http://launchub.com</p>	<p>Number of applications –n/a</p> <p>2) Applications for initial registration of traders considered within the statutory three days. The fee for registration of a limited liability company is currently well below the specified amount of 100 €. Normative acts regulating measures are available on the following websites : http://www.registryagency.bg/downloads/ZTR.pdf http://www.registryagency.bg/downloads/tarifa.pdf</p> <p>In execution of a measure adopted 7 of Decision № 484/15.08.2013 of the Government package of measures to reduce the regulatory burden has drafted amendments to the Law on the Commercial Register, which provides for a reduction of the period of initial registration of traders from 3 days to one day or spelled text reads: "by the end of the next business day after receipt of the application ." The project is currently at the stage of consultation, according to the rules of MS. Providing for a reduction of fees for registration of traders in the Commercial Register to the Registry Agency. The project is currently at the stage of consultation, according to the rules of MS.</p>
13	Review of the State Aid Framework	Regular administrative measures. Not any other information	1) State aid measures (or related policy initiatives) and classified as aid for innovation clusters in the Community Guidelines for State Aids for R&D and Innovation – regular control; no information for another one
14	EU Patent	Signed the unified court agreement on 19 February 2013, to be entry into force in 2015	Ratification of the Agreement on a Unified Patent Court – yes
15	Screening of Regulatory Framework	Regular administrative measures. No any other information	Regular administrative measures. No information on ex-ante or ex-post screening of new or existing regulations regarding their impact on innovation
17	Public Procurement	The New OP "Competitiveness and innovation" and OP "Scientific research for smart growth" projects (as of the end of 2013) introduce national target on public procurement of innovative goods and services. They suggest public tenders launched that include innovation criteria; public tenders launched for joint public procurement of innovation, which updates of national procurement policy with a specific objective of supporting innovation	n/a

20	Open Access	<p>1) At the current stage of development in Bulgaria it is difficult to distinguish between research data and scientific publications. At a special meeting of the Association of University Libraries (AUL) in 2010, the steps to build open repositories were outlined.</p> <p>2) The Bulgarian Academy of Sciences (BAS), intends to establish a network of scientific Open Access centres. Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS) will be the coordinator of the Bulgarian network and will provide support for academic institutions and researchers. IMI-BAS will launch a national project to develop the research infrastructure and digital repositories for researchers, educators, public bodies and companies who need contemporary scientific and education information and resources (Implementing Open Access Mandates in Europe, 2012)</p> <p>2) As of August 2012, there were six Bulgarian open access repositories registered in Open-door: those of the New Bulgarian University, IMI-BAS (Bulgarian Digital Mathematics Library and Bulgarian Openaire Repository), Burgas Free University, Sofia University "St. Kl. Ohridski", and Medical University of Sofia. Apart from them there is a repository at Tsenov Academy of Economics and a pilot repository of the University of Rouse.</p> <p>3) further measures on electronic identity for giving researchers transnational access to digital research services are taking place.</p>	<p>1) . Open Air (Implementing Open Access Mandates in Europe, 2012) reports that the Bulgarian research community is well informed about the benefits of open access and uses open access research publications, but the promotion of open access is more of an individual effort than the result of institutional support or policy. There is a certain level of awareness among libraries, though still very few institutions are involved in managing repositories.</p> <p>2) Policies on access and usage for research and education-related public e-infrastructures and for associated digital research services</p> <p>3) Measures on electronic identity for giving researchers transnational access to digital research services are taken. Introduced PIN code allows such access.</p>
21	Knowledge Transfer	<p>1) Policies and instruments launched to protect the results of publicly funded research concern internal rules of RO.</p> <p>2) National Strategy of Scientific Research to 2020 provides the following instruments to support transfer between public and private sectors:</p> <p>Extension of the schemes providing start-up capital to finance risk research and guarantee company sustainability at the market;</p> <p>Introduction of schemes for design of engineering disciplines at universities;</p> <p>Introduction of employment promotion schemes for young researchers at companies;</p> <p>Exchange of results and effective know-how transfer between the Scientific Research Fund and the National Innovation Fund;</p> <p>Pro-active measures for intellectual property protection.</p> <p>Introduction of targeted programmes</p>	<p>1) Policies and instruments launched to protect the results of publicly funded research are in process of improvement;</p> <p>2) Set up of national knowledge transfer (KT) strategies</p> <p>There are number of collaboration projects between science and business</p> <p>3) no new legal and other regulatory barriers to the transfer of knowledge between the public and the private sector</p> <p>4) New initiatives in support of R&D co-operation projects (including KT) between public/academic/non-profit sector research institutions and enterprises (including specific schemes to encourage the business sector to fund research in research institutions) have been discussed</p> <p>5) Creation of framework conditions through policies or other measures to incentivise and reward academics engaged in cooperation with industry – in progress</p> <p>6) New 'partnerships' and joint collaborative research agendas signed between the public</p>

		<p>supporting scientific activity in SMEs and creation of managerial culture for collaboration with scientific institutions; Training of young personnel on demand and with the financial commitment of the business; Establishment of networks of regional institutions and scientific organisations for implementation of targeted regional tasks and programmes; Furthering and intensification of knowledge transfer through schemes for creation of scientific incubators; Maintenance of a national interactive platform for linking education, science and business. All instruments related to establishing the connection between the knowledge triangle elements will be utilised under the leading role of the Ministry of Economy, Energy and Tourism. 4)The New OP “Competitiveness and innovation” and OP “Scientific research for smart growth” projects (as of the end of 2013)</p>	<p>and private sector –in progress 7) Policies and measures that improve recognition and professionalization of KT activities and that strengthen the role played by knowledge transfer offices (KTO) – in progress 8) Newly created public funding schemes used to support the commercialisation of innovative ideas – in progress - 9) New grant-based support schemes for testing commercialisation potential of research results– in progress 10) Policies and funding schemes used to encourage open innovation, co-operation and knowledge sharing and to create a more favourable business environment for SMEs, such as innovation/knowledge clusters, knowledge transfer platforms or voucher systems– in progress 11) New financial support schemes directed to enterprises or for services aimed at encouraging technology acquisition (licensing, joint ventures, testing, etc.) and knowledge transfer and other cooperation schemes between enterprises that aims to develop or introduce innovations– in progress. 12) New measures or schemes directed at public/private organisations in order to provide or coordinate the provision of specific innovation related services to enterprises (including technology transfer/brokerage, strategic and economic intelligence, manufacturing advisory services, quality and design advice, etc.) – in progress</p>
22	European Knowledge Market for Patents and Licensing	Informationnot available –n/a	<p>1) New policies and instruments for developing knowledge markets for patents and licencing - n/a 2) National initiatives in trading platforms that match IP supply and demand and market places to enable financial investments in intangible assets - n/a 3) New initiatives providing support (incl. provision of information through road shows, open days, exhibitions, IP to promote business success, patent information centres, training, direct support to IPR) for patenting, trademarks, copyright, design rights and their commercial exploitation- n/a</p>
23	Safeguarding Intellectual Property Rights	n/a	<p>1) Legislation, policies or other type of measures supporting the use of the Guidelines on Horizontal Cooperation Agreements namely regarding standard-setting agreements - n/a</p>
24	Structural Funds and Smart Specialisation	Innovation Strategy for smart specialisation	published for public discussion
25	Post 2013 Structural Fund Programmes	design of the new SF programmes	Status of the design of the new SF programmes: in progress

26	European Social Innovation pilot	Measures that provide support to encourage social innovation under OP HRD 2013	1) Measures and policies adopted that provide support to encourage social innovation implemented; about those including innovation driven by or centred around end- or intermediate users, including support to living labs, design innovation, creative labs, crowd-sourcing, etc. – in progress
27	Public Sector Innovation	-Prizes of the President of RBulgaria- Dec.2013 – for innovative enterprise -Prizes of MEET – Dec. 2013 –for innovative enterprise; Nov 2013 – for innovative furniture; Feb., 2023 – for innovative municipality of Burgas -Union “Made in Bulgaria” – dec.2013 – prizes for innovative products – march 2013, nov., 2013- for innovative enterprise	1) Prizes launched by sector/topic, including number of winners and amount of prices, distinguishing ex post and inducement prices 2) Publication of government-owned data to be made available and that can be used as a resource for information – at the web of MEET –mi.government.bg
29	European Innovation Partnerships	Bulgaria is included in several initiatives of the European innovative partnership (EIP). Among them are: Patient medication adherence programs; European Union Virtual Ageing Research Data Base; Ambient Assisted Living for All; AgeingWell - Network for the Market uptake of ICT for Ageing Well; Self-care support in pharmacy / AESGP - Association of the European Self-Medication Industry; From cradle to ageing well perspectives in chronic diseases&telemedicine mgt-Investigating alt.paths / Fondazione Democenter-Sipe; EHTEL support to Capacity Building towards Seamless Integration for Personal Health Services by 2020 / EHTEL; Societal Impact of Pain / European Federation of IASP Chapters (EFIC); Improving nutrition in the elderly / AESGP - Association of the European Self-Medication Industry; Active and Healthy - The role of the physical therapist in physical activity / European Region of the World Confederation for Physical Therapy; Older Immigrants and Active and Healthy Ageing / Julius Center for Health Sciences and Primary Care	National participation in EIP – So far EIP has made no investments in Bulgaria. EIP may invest up to 40% of the Fund in Bulgaria, etc. (https://webgate.ec.europa.eu/eipaha/initiative)
30	Integrated Policies to Attract the Best Researchers	As a result of the low attractiveness of the Bulgarian research system (low salaries, archaic research infrastructure, administrative burden, low level of (private) funding, etc.), it is difficult to attract national researchers back home or to attract third-country researchers to work in Bulgaria. However, Bulgarian researchers nurture their networks with Bulgarian colleagues working on international projects abroad. Generally, provisions allowing third-country researchers to work in Bulgaria do exist (such as the Foreign Nationals Act) but do not resulting in (leading) national and third-country researchers being attracted to Bulgaria. As a general rule, national grants and fellowships are not	1) the country is not attractive enough to implement any integrated policies put in place to ensure that leading academics, researchers and innovators reside and work in Europe and to attract a sufficient number of highly skilled third country nationals to work in Europe

		open to non-residents	
31	Scientific Cooperation with Third Countries	<p>-Cooperation with MS is a priority. Current programmes – COST, JRC, 7 FP</p> <p>-130 bilateral cooperation projects</p> <p>-The country is part of 23 transnational collaboration networks, working in 8 programmes with 15 organizations.</p>	<p>Participation in FP7 with a budget –Euro 47.09m, position -4.69% of total FP7.</p> <p>Top fields - ICT, research for the benefit of SMEs, SSH, health, environment, infrastructure, research potential.</p> <p>ERA Watch (2012) observes that there is:</p> <p>Need of strategic guidelines for participation in European coordination and integration of research funding</p> <p>Need of further regulations and incentives in regard to the cross-border cooperation, jointly funded activities, as well as common foresight.</p> <p>Need of more effective mechanisms to support the preparation of European projects under the EU Framework Programmes. Re-institutionalising of the Bulgarian Council on Innovation and its advisory functions on issues such as international cooperation, envisaged in the forthcoming Law on Innovation.</p> <p>It also states that the ERA-research policies are formally integrated in the national research policy documents and strategies. The research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes, however these are primarily project-based and institutional support is insufficient.</p> <p>.</p>
32	Global Research Infrastructures	<p>At the moment there are no modern research infrastructure. However, Bulgaria is already included in a number of European projects to prepare the establishment of research infrastructure facilities. These are: ESSurvey - European Social Survey (Bulgaria is included in 2005); EURO-ARGO - Global Monitoring of the oceans and seas (start in 2011); SPIRAL2 - accelerator and tools for extracting very rare radioactive isotope beams with intensities exist to date (2010); CLARIN - Electronic linguistic patterns; ERICON-AB AURORA BOREALIS - building icebreaker for scientific purposes; ELI - mega-light laser; BBMRI - European infrastructure biobanking; PRACE - Partnership for critical computing research in Europe (2010).</p>	<p>National involvement in agreements on the development of RIs which, owing to cost and / or complexity – in progress</p>
33	National Reform Programmes	<p>1) The areas of intervention through ESI Funds in Bulgaria for the programme period 2014–2020 are defined as a cross point between European priorities set out in the National Reform Programme, which implements the Europe 2020</p>	<p>Main R&I relevant aspects included in NRP</p>

Strategy for inclusive, smart and sustainable growth, and the priorities set in the National Development Programme. 4 strategic and mutually complementing financing priorities have been identified. These financing priorities also cover the eleven thematic goals set by EC in the draft for a General Regulation for the programme period 2014–2020.

— Priority 1: Education, training and employment for inclusive growth -further modernisation of the labour market and social systems; improvement of knowledge, skills and qualifications of human resources, including in support of labour force adaptability.

Investments from the European Structural and Investment Funds under this priority will be implemented in the framework of Thematic Goal 8: “Employment promotion and support for labour force mobility”; Thematic Goal 9: “Encouragement of social inclusion and fight against poverty”, and Thematic Goal 10: “Investment in education, skills and life-long learning”.

— Priority 2: Innovation and investment for smart growth

ESI Funds in Bulgaria will focus on addressing the most serious challenges for the achievement of smart growth in the Bulgarian economy, namely: low competitiveness and productivity of SMEs in all sectors, insufficient rate of research and development and innovation market-oriented activities, and unsatisfactory access to and use of ICT.

Investments from the European Structural and Investment Funds under this priority will be implemented in the framework of Thematic Goal 1: “Strengthen research and development activity, development of technology and innovations”; Thematic Goal 2: “Improvement of access to Information and Communication Technologies (not including e-government)”; and Thematic Goal 3: “Enhancing the competitiveness of small and medium-sized enterprises; the agricultural sector (EAFRD) and the fisheries and aquaculture sector (EMFF)”.

— Priority 3: Connectivity and green economy for sustainable growth

— Priority 4: Good governance and access to quality public services

2). By the end of 2013, a new Innovation Strategy for Smart Specialisation is published for discussion. It defines the national and regional priorities in the area of innovation. In the framework of the Partnership Agreement concerning the use of the Structural Funds and the Cohesion

		<p>Fund, Bulgaria will propose two mutually complementing operational programmes in the R&D area in the period 2014-2020: "Innovations and Competitiveness" and "Science and Education for Smart Growth".</p> <p>To achieve the national target concerning R&D, measures have been put in place to improve the conditions for professional realisation of young scientists/scholars, support for SME start-ups and implementation of innovative projects, and development of a pro-innovative and research infrastructure</p>	
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Annex 3. NATIONAL PROGRESS TOWARDS REALISATION OF ERA

ERA Priority	ERA Action	Recent changes	Assessment of progress in delivering ERA
1. More effective national research systems	Action 1: Introduce or enhance competitive funding through calls for proposals and institutional assessments	<p>2. There is no official information about the exact share of institutional funding allocated on a competitive basis.</p> <p>3. The evaluation practices to ensure the quality of research and provide basis for long-term planning are an element of accreditation of HEIs and BAS, provided by the National accreditation agency</p> <p>4. The 2010 amendments to the Law on Scientific Research Promotion put a start to a more effective monitoring and evaluation procedure of projects funded under the National Science Fund</p>	<p>1. (+) There are measures of the National Strategy of Scientific Research to 2020 aiming to introduce a "financing model stimulating competition":</p> <p>(-) It is questionable if these measures could be accepted as introducing "competitive basis".</p> <p>(+) It is possible to measure, taking into account publicly available data and rules".</p>
	Action 2: Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review	<p>3. The evaluation practices to ensure the quality of research and provide basis for long-term planning are an element of accreditation of HEIs and BAS, provided by the National accreditation agency</p> <p>4. The 2010 amendments to the Law on Scientific Research Promotion put a start to a more effective monitoring and evaluation procedure of projects funded under the National Science Fund</p>	<p>3. (+) The evaluation practices to ensure the quality of research and provide basis for long-term planning are an element of accreditation of HEIs and BAS, provided by the National accreditation agency.</p> <p>3. (-) Public research organisations are subject to only sporadic international evaluations and no consistent data is available on their research performance (except BAS)</p> <p>4. (-) Since Autumn 2012 there is a public concern about corruption of resources involving Rangel Gjurov, who chairs the executive board of the Ministry of Education and Science's Bulgarian National Science Fund. An investigation found widespread irregularities in the NSF's handling of funding requests in 2008 and 2009, including using unqualified referees, and selectively ignoring referees' comments to favour particular projects. (Nature, Funding protest hits Bulgarian research agency).</p> <p>4. (+) debate is active in</p>

			bulgarianscience.com forum and several measures to solve the problems have been suggested.
2. Optimal transnational co-operation and competition	Action 1: Step up efforts to implement joint research agendas addressing grand challenges, sharing information about activities in agreed priority areas, ensuring that adequate national funding is committed and strategically aligned at European level in these areas	<p>1. Active in JPA: Cultural Heritage and global change: a new challenge for Europe</p> <p>2. The National Strategy of Scientific Research to 2020 states the following: It is important that we have an active stance on the new European initiatives, such as implementation of joint programming initiatives between the individual Member States. This is a long-term strategic process and it is performed through voluntary mechanism of partnership between the countries. The implementation of joint programmes will increase the effectiveness and impact of national funding on R&D activities in strategic areas. The project implementation through bilateral scientific and technological cooperation is of great significance to us being a reliable partner in demand in future. The gradual expansion of the partner countries on European and global scale is important for the building of large interdisciplinary research networks and consortia.</p>	<p>(-)There is only one joint research agenda</p> <p>(+)There are 23 bilateral scientific collaboration agreements and Networks the country is participating in. and implementation.</p> <p>(+).A number of countries and international partners with which the Bulgarian government and the MEYS have signed inter-state legal acts, cooperation is achieved solely on the basis of direct inter-institutional agreements. The Bulgarian Academy of Sciences has concluded scientific bilateral agreements with EU-countries and countries outside Europe.</p> <p>(+)The ERA-research policies are formally integrated in the national research policy documents and strategies.</p>
	Action 2: Ensure mutual recognition of evaluations that conform to international peer-review standards as a basis for national funding decisions	Implementation of mutual recognition of evaluations that conform to international peer-review standards as a basis for national funding decisions (peer review standards defined in ESF peer review guide) has been started.	<p>2. (+)A good example is the joint ESF and ALLEA International evaluation "Research at the Bulgarian academy of sciences" in 2009 which has applied the best practices in international peer review. The evaluation has led to the re-structuring and re-focusing of BAS research taking place up to now.</p> <p>2. (-)Public research organisations are subject to only sporadic international evaluations and no consistent data is available on their research performance.</p> <p>2(+)+ there are 11 journals in the ISI publication list from Bulgaria (2012&2013)</p>
	Action 3: Remove legal and other barriers to the cross-border interoperability of	The ERA-research policies are formally integrated in the national research policy documents and strategies.	(+) The research organisations, universities and PROs have increasingly better access to

	national programmes to permit joint financing of actions including cooperation with non-EU countries where relevant	international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes. (-) these are primarily project-based and institutional support is insufficient. (-) The Researchers Report (EU, 2012) reports that non-competitive salaries, archaic research infrastructures, administrative burden, a low level of R&D funding (0.55% of GDP in 2010) as well as a low level of funding from industry are the main obstacles to researchers' mobility in Bulgaria.
	Action 4: Confirm financial commitments for the construction and operation of ESFRI, global, national and regional RIs of pan-European interest, particularly when developing national roadmaps and the next SF programmes	At the moment there is one modern research infrastructure constructed per priority scientific areas (+)The National reform programme reports in 2013, along with the development of Sofia Techno park (+) However, Bulgaria is already included in a number of European projects to prepare the establishment of research infrastructure facilities. These are: ESSurvey - European Social Survey (Bulgaria is included in 2005); EURO-ARGO - Global Monitoring of the oceans and seas (start in 2011); SPIRAL2 - accelerator and tools for extracting very rare radioactive isotope beams with intensities exist to date (2010); CLARIN - Electronic linguistic patterns; ERICON-AB AURORA BOREALIS - building icebreaker for scientific purposes; ELI - mega-light laser; BBMRI - European infrastructure biobanking; PRACE - Partnership for critical computing research in Europe (2010). (-) No data found regarding the financial commitment to support this kind of infrastructures.

	<p>Action 5: Remove legal and other barriers to cross-border access to RIs</p>	<p>There are some objectives defined in the National Strategy of Scientific Research 2020: Construction of competitive Research Infrastructures as an element of the ERA ,Improvement of the service and control of the Research Infrastructure in Bulgaria</p> <p>The current Condition of Research Infrastructures (Resolution No. 692 of 21 September 2010 for acceptance of National Roadmap for Research Infrastructure) can be described as follows:</p> <p>Lack of portfolio of funds for establishment and support of research infrastructure, including low knowledge of hazardous, rental and under guarantee mechanisms; Lack of interest, financial stability and help on the part of industry;"</p>	<p>There is no data about share of non-national researchers (from Member States, Associated Countries and Third Countries) accessing RI of European Interest.</p> <p>In resume, there are objectives defined in the National Strategy towards cross-border access to RI, but the implementation is still a challenge.</p>
<p>ERA priority 3: An open labour market for researchers</p>	<p>Action 1: Remove legal and other barriers to the application of open, transparent and merit based recruitment of researchers</p>	<p>"The "Law on the Development of Academic Staff" enables universities to define their own staff policy. In addition, it provides a mechanism for regulating the careers of scientific personnel. The implementation of the new Law will result in a qualification and career development system for academic staff (planned for 2014). Job vacancies are published on university websites (however mostly in Bulgarian), as well as on the EURAXESS jobs portal. In addition, job vacancies are published on other platforms (e.g. the labour agency). It is not a statutory requirement, however, to advertise job vacancies on the EURAXESS jobs portal.</p>	<p>A survey 2012-2013 shows 82,9% of teaching staff of state universities would like to leave because of the low salaries, 55% of them refer to the recruitment system. On other r hand 2,4% of all respondents define the recruitment system as a reason to stay with. the results are similar to those of 2007-2008. (M.Matev, I., Zareva, A.Kirova)</p>
	<p>Action 2: Remove legal and other barriers which hamper cross-border access to and portability of national grants</p>	<p>As a result of the low attractiveness of the Bulgarian research system (low salaries, archaic research infrastructure, administrative burden, low level of (private) funding, etc.), it is difficult to attract national researchers back home or to attract third-country researchers to work in Bulgaria..</p>	<p>Bulgarian researchers nurture their networks with Bulgarian colleagues working on international projects abroad. Generally, provisions allowing third-country researchers to work in Bulgaria do exist (such as the Foreign Nationals Act) but do not resulting in (leading) national and third-country researchers being attracted to Bulgaria. As a general rule, national grants and fellowships are not open to non-residents.</p>

			The Bulgarian Government has not put in place any specific measures supporting the portability of grants (The Researchers Report 2012)
Action 3: Support implementation of the Declaration of Commitment to provide coordinated personalised information and services to researchers through the pan-European EURAXESS3 network	Bulgarian Rectors' Conference has signed the Charter and Code. EURAXESS Bulgaria provides up-to-date information and personalized assistance to mobile researchers and highly qualified specialists. In addition to the portal, EURAXESS Bulgaria has 2 coordinating organizations (BHOs) 12 Local Contact Points (LoCPs) . The coordination of EURAXESS Bulgaria is handled by Sofia University and the Institute of Technology and Development (ITD) Foundation.	.	The portal contains all necessary information for a researcher moving to Bulgaria – it explains the entry and visa conditions, taxes and social security and daily life in Bulgaria. It also provides information on job offers from universities and other institutions as well as scholarships and grants for research to support researchers in search of funding opportunities
Action 4: Support the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training.	Some recent developments are following the principles for innovative doctoral training., National Strategy of Scientific Research to 2020 defines that special attention will be paid to attracting and keeping young and talented people in science. (+) National Strategy of Scientific Research to 2020 states also that Joint degree programmes with leading European universities has been introduced, finishing with issuance of a separated diploma by both universities. It also announces that special attention will be paid to attracting and keeping young and talented people in science. According to the strategy, programme operation will continue, and they will be further developed, under which young scientists may receive support following the project principle – introduction of “project-based” doctoral studies, post-doctoral programmes, funding of young people’s participation at international conferences, provision of funds for publication in reference magazine, etc.; Faculty, students and doctoral students exchange and cooperation with other HE institutions is supported and expanded to promote teaching, research, expert, and creative activities to expand the educational profile of doctoral students through joint projects with international universities. What concerns the Dedicated	Among them, as mentioned in The Researchers Report 2012) are:	-Career prospects of PhD students (e.g. mentoring, alumni networks, participation at job events) -Schemes and support actions fostering interdisciplinary research (e.g. shared supervision of the work of the doctoral candidate, networks representing several scientific disciplines) -Schemes or activities to expose PhD students to industry/other relevant employment sectors (e.g. placement, private-funding, involvement of non-academics...) Schemes and support actions for international networking (e.g. collaborative research, joint degrees, participation in international conferences, short/long research visits, secondments, etc.) -Schemes and support actions for the provision of transferable skills training (e.g. training on communication, teamwork, entrepreneurship, project management, intellectual property rights, etc.) (-)The Bulgarian Government has not put in place a dedicated ‘Skills

		<p>quality assurance system for doctoral training on institutional level, the National Evaluation and Accreditation Agency states that the universities that can offer doctoral programs should be carefully selected. According to the Higher Education Act, only doctoral programs rated with the maximal grade “very good” are accredited. The accreditation of a doctoral program by the agency is realized at two levels – as an integral part of the institutional accreditation of the higher education institutions necessary for completeness of the evaluation of their teaching and research potential and by means of a subject evaluation of each scientific specialty listed in the National Classifier. Instruments used by the Agency:</p> <ul style="list-style-type: none"> -Carrying out impact assessment in application of new solutions and measures in the field of science and innovation; Introduction of compulsory, regular international evaluation of the organisations providing financing to and carrying out scientific research, R&D and innovation; -Regulation of long-term objective evaluation and monitoring criteria of scientific programmes and results; -Definition of a system for regular internal evaluation of scientific organisations with clear long-term criteria. 	<p>Agenda’ aimed at improving researchers’ employment skills and competencies.</p> <p>(+)However, the improvement of researchers’ skills and competencies is addressed in different laws and regulations and forms part of national and international research projects. In 2006 the Ministry of Economy and Energy (currently Ministry of Economy, Energy and Tourism) launched an initiative for the creation of entrepreneurship centres in the universities in order to encourage entrepreneurship skills in students and the creation of new technology firms. According to Measure 10 of the National Innovation Strategy, centres for the promotion of entrepreneurship activity of university students have been set up in four universities.</p>
	<p>Action 5: Create an enabling framework for the implementation of the HR Strategy for Researchers incorporating the Charter & Code</p>	<p>In 2007, representatives of the Bulgarian Rectors Council (made up of the largest Bulgarian Universities) have signed the ‘Charter & Code’.</p> <p>Operational at national and regional level, there is a Career Development Centres which assist young students in choosing a study discipline as well as finding a vocational training place.</p> <p>National Strategy of Scientific Research to 2020 counts with a special Instrument for the Promotion of scientist mobility and support to the development of career centres and regional scientist mobility units as part of the European Mobility Network. It</p>	<p>(+)The ERA-research policies are formally integrated in the national research policy documents and strategies.</p> <p>(-) Still, there are no specific regulations or schemes for increasing the researchers’ salaries. Institutions and employers adhering to the Code of Conduct will openly demonstrate their commitment to act in a responsible and respectable way and to provide fair framework conditions to researchers, with a clear intention to contribute to the advancement of the European Research Area</p>

		<p>states that Special attention will be paid to attracting and keeping young and talented people in science. Programme operation will continue, and they will be further developed, under which young scientists may receive support following the project principle – introduction of “project-based” doctoral studies, post-doctoral programmes, funding of young people’s participation at international conferences, provision of funds for publication in reference magazine, etc. It also points out that the continuous training opportunities are of great significance, including distance learning in higher education, improvement of scientific employees’ qualification and skills and realization of joint programmes for scientific training and practice between academic and business communities.</p> <p>Furthermore, the National Evaluation and Accreditation Agency aims at:</p> <p>Stimulating the participation of scientific organisations and universities in international programmes and projects; Providing awards for research excellence and ‘chair competence’, according acknowledgement and enhancement of the prestige of researchers in society and Attracting young people to become researchers.</p>	<p>research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes. The research organisations, universities and PROs have increasingly better access to international knowledge through long-term agreements with European counterparts, European research organisations and the Framework programmes, these are primarily project-based and institutional support is insufficient. The Researchers Report (EU, 2012) reports that non-competitive salaries, archaic research infrastructures, administrative burden, a low level of R&D funding (0.55% of GDP in 2010) as well as a low level of funding from industry are the main obstacles to researchers’ mobility in Bulgaria. Since there are some strategies developed, the degree of implementation of the Framework can be assessed as medium.</p>
ERA priority 4: Gender equality and gender mainstreaming in research	Action 1: Create a legal and policy environment and provide incentives	<p>The Bulgarian strategic documents are harmonised with the European requirements, including in the area of equal treatment of women and men in research. This harmonisation of strategic documents is according to Council Directive 2000/78/EC, 20001127 of 27 November 2000. Bulgaria has not adopted specific gender equality legislation.</p> <p>The main efforts of the Government in the field of gender equality and antidiscrimination on all grounds aim at: building the capacity of the administration at central and local level of governance, of the judiciary, of social partners on the issue; strengthening the national institutional mechanism; raising the</p>	<p>There are no national policies fostering gender as criteria in research programmes, but there are some stakeholder initiatives. However, it is not evident how many and how teachers do use them, and with what impact.</p> <p>A Master’s degree programme in Gender Studies is available to the students at the Faculty of Philosophy of the St Kliment Ohridski University of Sofia. This is the only programme of its kind in the country. Occasionally separate courses in the connection</p>

	<p>awareness and sensitivity of the society; and implementation of the National Strategy for Promotion of Gender Equality (2009-2015), which main objective in the sphere of education is "eradication of stereotypes". Awareness raising and training in gender equality is included among others in the operational target "Promotion of civic education and training".</p> <p>The Protection against Discrimination Act contains a special chapter on education considering that bachelor and master curricula are included in the term "education". It requires that "Individuals conducting education and training, as well as authors of textbooks and manuals for learning, shall provide information and apply educational and training approaches enabling the overcoming of stereotypes referring to the roles of women and men in all spheres of public and family life. Kindergartens, schools and higher schools shall include in their educational curricula and syllabuses training on gender issues (Art. 35)".</p> <p>The Ministry of Education, Youth and Science (MEYS) reported in 2010 that gender equality is one of the themes in the school books in "History and civilizations" in VI grade of the secondary school. MEYS promotes training aids which can help teachers in terms of methodology and content of teaching in the field of gender equality⁶, developed under different projects mainly by NGOs. A "Guide on equal treatment" was developed for educators, police officers and local authorities in 2010, and in 2011 training modules for teachers in prevention of discrimination including some gender equality issues(Exchange of good practices on gender equality, 2012).</p> <p>Further related data: The index value is 0,32 corresponding to high participation level of women in research Share of female PHD Graduates 0.48 in 2010 (She Figures 2012). Share of female academics in Grade B positions 0.26 in 2010</p>	<p>with the subject of gender equality are offered within the degree programmes in Pedagogy (e.g. elective course on violence against women), Sociology, Cultural Anthropology, Literature, etc. in different universities in the country. Academic researches on the matters of gender in education are focused mainly on the content of the school books for primary and secondary education.</p> <p>The 2012 National Action Plans on Equality of Women and Men envisages elaboration of a motion to the higher education institutions on including equality issues, protection against discrimination and gender equality into the process of teachers' education and qualification (Exchange of good practices on gender equality, 2012).</p> <p>The information which was found relates to general gender equality measures, because there are no specific R&D measures. The approach taken in Bulgaria includes actions for encouraging equality, mobilization of all basic policies and measures to achieve equality by active and open alignment of the stage of planning their possible impacts on the position of men and women (taking the gender perspective into consideration).</p> <p>The National strategy for promotion of gender equality for the period 2009-2015 fosters gender equality in governance and decision-making and equality of women and men in the authorities making decisions in the field of development of science. Although that not mentioned explicitly, it is</p>
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	<p>(She Figures 2012)</p> <p>Share of female academics in Grade A (full professors) positions 0.17 in 2010. (She Figures 2012)</p> <p>Share of female heads of institutions in the Higher Education Sector 0.144 in 2010. (She Figures 2012).</p>	<p>understood that audit is between the supported/requested activities. The strategy applies “an integrated approach for equal treatment of women and men” which includes actions for encouraging equality, mobilization of all basic policies and measures to achieve equality by active and open alignment of the stage of planning their possible impacts on the position of men and women (taking the gender perspective into consideration). In order to achieve this, the strategy point out that it is necessary to account for the gender indicator in all policies, programmes and strategies, legislation and the provision of services on the basis of gender analysis, which would establish where the structures, systems and stereotypes in society lead to inequality on grounds of gender.</p> <p>In Bulgaria there is L'Oreal and UNESCO's fellowship program "For Women in Science".</p>
<p>Action 2: Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender</p>	<p>Not many institutions of the science system are involved in cultural change on gender, but the Ministry of Education, Youth and Science (MEYS) reports some initiative on gender equality.</p> <p>It is important to note, that in 2012 there was launched a Bulgarian Centre of Women in Technology (BCWT), a new organization established to promote more girls and women in the technology sector.</p> <p>There is another – older organization with a similar aim – Club of women in science and industry at the Federation of scientific technical unions of Bulgaria.</p> <p>The share of under-represented sex on boards designing/defining</p>	<p>The Bulgarian Gender Research Foundation was established in 1998. The organization works in the field of gender equality, prevention of domestic violence, protection of reproductive rights and anti-discrimination by providing information, elaborating and conducting research, analyses and draft laws, conducting campaigns and lobbying for legislative changes, provision of training and consultations for professionals and working in wide networks in cooperation with other organizations, public institutions and experts.</p> <p>The foundation reports (Bulgarian Gender Research Foundation, 2012) that</p>

		national research priorities and policies is 0.29 in 2010. (She Figures 2012).	gender stereotyping exists in Bulgaria especially in the field of advertisement and media and the phenomenon doesn't receive enough and proper attention from the government. It states that there is absence of adequate gender equality policies, combined with the non-supervision and non-implementation by the State of the legal provision in the Anti-Discrimination Law.
	Action 3: Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating	There are no specific quotas in place regulating the balance between men and women in the research (The Researchers Report, Country Profile Bulgaria, 2012)	n/a
ERA priority 5: Optimal circulation, access to and transfer of scientific knowledge including via digital ERA	Action 1: Define and coordinate their policies on access to and preservation of scientific information	National reform programme 2012-2014 includes support to open access through infrastructure support for building and maintaining high-performing computing infrastructure, and access to different network infrastructures like GRID networks, European digital data bases. To be adopted in 2014. ERA initiative open access infrastructure for research in Europe (OPEN AIRE) of 2010 includes setting up of data repository of Open Access to research outputs, journal articles, conference papers and datasets of various kinds, also setting up links of the national repositories to European repositories. The digitalization of valuable materials from the St. St. Cyril and Methodius National Library collections started in 2006. In autumn 2007 these digital images became accessible for users through the library's website. Over 290 000 files have been digitalized till the end of 2012 – manuscripts, old printed books, unpublished documents from the Bulgarian Historical Archive and Oriental Department, portraits and photos, graphical and cartographical editions, Bulgarian newspapers and journals from 1844 to 1944 – images and their systematical descriptions. Users could search in the Electronic archive through the	At the current stage of development in Bulgaria it is difficult to distinguish between research data and scientific publications. Open Air (Implementing Open Access Mandates in Europe, 2012) reports that the Bulgarian research community is well informed about the benefits of open access and uses open access research publications, but the promotion of open access is more of an individual effort than the result of institutional support or policy. There is a certain level of awareness among libraries, though still very few institutions are involved in managing repositories. At a special meeting of the Association of University Libraries (AUL) in 2010, the steps to build open repositories were outlined. According to the NRP2012 since 2011 the "Science + Business" project assists the participants in the science-innovative system in maintaining sound and flexible dialogue on issues and problems of common interest with view to overcome imperfect

	<p>specialized system DocuWare. The digitalized originals are on free access for users.</p> <p>Central library of the BAS provides free on-line access to on-line resources. The resources are accessible via BAS IP addresses. There are different data bases of on line resources http://cl.bas.bg/information-services/on-line. The world's largest bibliographic database, providing the foundation of cooperative library services in metadata management, discovery, resource sharing and collection management (OCLC WorldCat®) . Support work together to improve access to the information held in libraries around the globe; reduction of the costs for libraries through collaboration.</p> <p>Open innovation (OI) and knowledge transfer (KT) between public and private sectors through national knowledge transfer strategies is taking place with the latest version of the draft for a Law on Innovations which proposes a new modern organization of innovation processes and eliminates the existing imbalances in the methods of financing research and innovation in enterprises.</p> <p>Open innovation (OI) and knowledge transfer (KT) between public and private sectors takes place with technology Transfer Offices. According to the NRP 2012 a Grant procedure (as defined in NRP 2011–2015) to establishing New and Strengthening the Existing Technology Transfer Offices has started in the amount of EUR 5 million.</p> <p>The Bulgarian Academy of Sciences (BAS), the coordinator of research in Bulgaria, intends to establish a network of scientific Open Access centres. Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS) will be the coordinator of the Bulgarian network and will provide support for academic institutions and researchers. IMI-BAS will launch a national project to develop the research infrastructure and digital repositories for researchers,</p>	<p>information and the lack of adequate environment, including a digital one.</p> <p>As of August 2012, there were six Bulgarian open access repositories registered in Open-door: those of the New Bulgarian University, IMI-BAS (Bulgarian Digital Mathematics Library and Bulgarian Openaire Repository), Burgas Free University, Sofia University “St. Kl. Ohridski”, and Medical University of Sofia. Apart from them there is a repository at Tsenov Academy of Economics and a pilot repository of the University of Rouse.</p> <p>In late 2008, the European Commission prepared a questionnaire on open access and preservation policies in Europe and Bulgaria did not respond.</p>
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	educators, public bodies and companies who need contemporary scientific and education information and resources (Implementing Open Access Mandates in Europe, 2012)	
Action 2: Ensure that public research contributes to Open Innovation and foster knowledge transfer between public and private sectors through national knowledge transfer strategies	<p>There are number of collaboration projects between science and business.</p> <p>National Strategy of Scientific Research to 2020 provides the following instruments to support transfer between public and private sectors:</p> <p>Extension of the schemes providing start-up capital to finance risk research and guarantee company sustainability at the market;</p> <p>Introduction of schemes for design of engineering disciplines at universities;</p> <p>Introduction of employment promotion schemes for young researchers at companies;</p> <p>Exchange of results and effective know-how transfer between the Scientific Research Fund and the National Innovation Fund;</p> <p>Pro-active measures for intellectual property protection.</p> <p>Introduction of targeted programmes supporting scientific activity in SMEs and creation of managerial culture for collaboration with scientific institutions;</p> <p>Training of young personnel on demand and with the financial commitment of the business;</p> <p>Establishment of networks of regional institutions and scientific organisations for implementation of targeted regional tasks and programmes;</p> <p>Furthering and intensification of knowledge transfer through schemes for creation of scientific incubators;</p> <p>Maintenance of a national interactive platform for linking education, science and business.</p>	<p>The Bulgarian Academy of Sciences (BAS), which coordinates research in Bulgaria, intends to establish a network of scientific open access centres. The Institute of Mathematics and Informatics at the BAS (IMI-BAS) coordinates this network and provides support for academic institutions and researchers. IMI-BAS has also launched a national project to develop the research infrastructure and digital repositories for researchers, educators, public bodies and companies who need contemporary scientific and education information and resources. This fosters the integration of academia, the public sector and industry; it also strengthens the institutional links between all major research and education organisations (the universities, the institutes of the Bulgarian Academy of Sciences, etc.) (Stanchev, 2012).</p> <p>All instruments related to establishing the connection between the knowledge triangle elements will be utilised under the leading role of the Ministry of Economy, Energy and Tourism.</p> <p>Project (2011) The Science + Business Project provides a platform for researchers to carry out projects in collaboration with industry. Supported by Universities, research institutes and businesses, the scheme fosters skills and knowledge transfer between the different parties.</p>

	<p>Action 3: Harmonise access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners</p>	<p>There is a Bulgarian Information Consortium, an organization of 38 members representing academic, public, and libraries aimed at sharing good practice and resource development. The mission of the Bulgarian Information Consortium is to provide the best information resources at the best possible price to the Bulgarian users, applying high professional selection criteria and offering the best services. It has the following goals:</p> <ul style="list-style-type: none"> To support and encourage the use of information resources in Bulgaria; To meet the information needs of the Association's members and their users; To negotiate preferential financial terms for the use of information resources for all Association's members; To encourage further development of information services provision through training, additional qualification, public relations and other appropriate means and methods; To foster the co-operation, resource sharing and exchange of experience between the members of the Association. <p>There are currently 32 Bulgarian open access journals available in the Directory of Open AccessJournals (DOAJ). In addition, a pilot repository of the University of Rousse and the Medical University of Sofia (MU Sofia) is now being tested which will be-come the Electronic Repository of the Central Medical Library of MU Sofia. There are some elements in place regarding the research e-infrastructure. In March 2012 there were 6 Open Access Bulgarian repositories in OpenDOAR (OpenAIRE Study, 2012). Research data (understood as recorded factual material) repository was not identified.</p>	<p>Bulgarian Academy of Sciences, Institute of Mathematics and Informatics (IMI-BAS) has launched a national project to develop the research infrastructure and digital repositories for researchers, educators, public bodies and companies who need contemporary scientific and education information and resources. In 2010 IMI-BAS organised the first national information day called Open Access to Scientific Information which was broadcasted on Bulgarian National Radio and other Bulgarian news media. IMI-BAS is a partner of the European Digital Mathematics Library (EuDML) project that design and build a collaborative digital library service to collate the current distributed content. It also help plan the long-term preservation of digital mathematical literature through a network of academic libraries that eventually be provided as open access (Stanchev, 2012). The main output of the research conducted at the IMI-BAS is a large number of original publications (about 250 scientific papers annually, some 160 of them in refereed journals and proceedings of prestigious international conferences). IT resources (including computer clusters, high-speed Internet connection, scientific databases, multimedia digital libraries). In 2007 in cooperation with Intel Education Bulgaria in IMI was established Intel Technology Innovation Centre for Advanced Software Engineering for work with multicore processors. The equipment of the Centre includes 4 multicore servers and 35 workstations</p>
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	<p>Action 4: Adopt and implement national strategies for electronic identity for researchers giving them transnational access to digital research services</p>	<p>Although that no explicit information was found from the revised information available online it is clear that currently there are no strategies for achieving electronic identity for researchers.</p>	<p>From 2009 to 2012 the institute of Technology and Development Foundation participated in a FP7 Project OpenScout which had the aim to provide an education service in the internet that enable users to easily find, access, use and exchange open content for management education and training.</p>
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LIST OF ABBREVIATIONS

ARC	Applied Research and Communications
BAS	Bulgarian Academy of Sciences
BERD	Business Expenditures for Research and Development
BGN	Bulgarian Lev New
BNB	Bulgarian National Bank
BPO	Bulgarian Patent Office
BulCRIS	Bulgarian Current Research Information System
CERN	European Organisation for Nuclear Research
CIF	Cost, Insurance, Freight
COST	European Cooperation in Science and Technology
CR	Country Report
EC	European Commission
EIP	European innovative partnership
EMBO	European Molecular Biology Organisation
ERA	European Research Area
ERA-NET	European Research Area Network
ERDF	European Regional Development Fund
ERIC	European Research Infrastructure Consortium
ERP Fund	European Recovery Programme Fund
ESA	European Space Agency
ESF	European Science Foundation
ESFRI	European Strategy Forum on Research Infrastructures
EU	European Union
EU27	European Union including 27 Member States
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
FDI	Foreign Direct Investments
FOB	Free on Board
FP	European Framework Programme for Research and Technology Development
FP7	7th Framework Programme
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GOVERD	Government Intramural Expenditure on R&D
GUF	General University Funds
HEI	Higher education institutions
HERD	Higher Education Expenditure on R&D
HES	Higher education sector
HRST	Human Resources in Science and Technology
ITER	International Thermonuclear Experimental Reactor
IP	Intellectual Property
IUC	Innovation Union Competitiveness
IUS	Innovation Union Scoreboard
MEE	Ministry of economy and energy
MEET	MEE before mid of 2013

MEYS	Ministry of Education, Youth and Science
MF	Ministry of Finance
NIF	National Innovation Fund
NRP	National Reform Programme
NSI	National Statistical Institute
NSF	National Science Fund
OECD	Organisation for Economic Co-operation and Development
OP	Operational Programme
OPDCBE	Operational Programme “Development of the Competitiveness of the Bulgarian Economy”.
OPHRD	Operational programme “Human Resources Development”
PRO	Public Research Organisations
R&D	Research and development
R&I	Research and Innovation
RI	Research Infrastructures
RIS	Regional Innovation Strategies
RTDI	Research Technological Development and Innovation
S&T	Science and Technology
SF	Structural Funds
SME	Small and Medium Sized Enterprise
SSS	Smart Specialization Strategy
VC	Venture Capital

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